

CAN SOCIAL NETWORKS ASSIST ANALYSTS FIGHT TERRORISM?

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Homeland Security

by

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ABSTRACT

CAN SOCIAL NETWORKS ASSIST ANALYSTS FIGHT TERRORISM?, by MAJ Michael V. Ciaramella, 92 pages.

My primary research question is: can social networks assist analysts fight terrorism? My secondary research questions are as follows. First, how does social networking create linkages? Second, how have social networks been used to solve small problems? Third, how have social networks been used to enact large-scale changes?

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While still under review, my initial conclusion is quite definitive. Social networks can assist analysts fight terrorism. While most evolutionary changes are impossible to see by the affected population due to its slow-moving, imperceptible growth, one only has to look at Tunisia, Egypt, and Libya to see the immediate effects of social networks.

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ACRONYMS

AR	Army Regulation
BBC	British Broadcasting Corporation
CENTCOM	United States Central Command
CIA	Central Intelligence Agency
CM*NET	International Network of Crisis Mappers
CNN	Cable News Network
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
DARPA	Defense Advanced Research Projects Agency
DHS	Department of Homeland Security
DISA	Defense Information System Agency
DNI	Director of National Intelligence
DoD	Department of Defense
DTM	Directive-Type Memorandum
DUI	Driving Under the Influence
EMS	Emergency Medical Services
EO	Executive Order
FBI	Federal Bureau of Investigations
GIS	Geospatial Information System
GPS	Global Positioning System
HUMINT	Human Intelligence
MASINT	Measurement and Signature Intelligence
MIT	Massachusetts Institute of Technology
NGO	Non-Governmental Organization

OSINT	Open Source Intelligence
STRATCOM	United States Strategic Command
TED	Technology Entertainment and Design
TRADOC	United States Army Training and Doctrine Command
UBL	Usama Bin Laden
USSOCOM	United States Special Operations Command

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CHAPTER 1

INTRODUCTION

The purpose of this study is to determine the feasibility of applying assets and technologies available to present day analysts, specifically the linkages created through social networks, to assist them when fighting terrorism. Analysts are often over-burdened with too much information that sometimes prevents them from identifying potentially dangerous activities. Many of the 9/11 terrorists operating on U.S. soil probably possessed not only linkages to terrorist organizations in other countries, but also to each other. A great deal of the information that associated several of the involved parties might have been publicly available in unclassified forums. The problem is analysts were unable to predict, with any degree of certainty, nor prevent, the 11 September 2001 attacks using public or classified information. Other than Open Source Intelligence (OSINT) analysis, the lack of alternative tools limited U.S. analysts attempting to build correlating relationships within public data until recently, with the advent of social networks.

Primary and Secondary Research Questions

The primary research question of this thesis is: can social networks assist analysts fight terrorism? The three secondary research questions are as follows. First, how do social networks create linkages? Second, how have social networks been used to solve small problems? Third, how have social networks been used to enact large-scale changes? It is important to note that these questions greatly evolved during the research for this thesis. The original topics of social networks, the 9/11 attacks, and OSINT proved to be too divergent to be included in a single study. Instead, the study focused solely on social networks and their applications on more recent events.

Intelligence Parameters

When attempting to answer the primary research question, one must consider the parameters of the operating environment for U.S. Department of Defense (DoD) Intelligence personnel. Intelligence regulations prevent U.S. analysts, such as the Defense Intelligence Agency (DIA) and the Central Intelligence Agency (CIA), from collecting data on U.S. persons. Executive Orders (EO) 12333 and 13355 severely restrict collection on U.S. citizens and limits U.S. person collection to only the Federal Bureau of Investigation's (FBI) domain (Domestic Operational Law 2010, 128-137). Army Regulation (AR) 381-10 further restricts U.S. Army analysts as well. Able Danger, a classified 1999 United States Special Operations Command (USSOCOM) intelligence gathering project, was deemed illegal for violating these laws. Since its findings were ordered destroyed, its analytic value remains unconfirmed, but reports indicate the study was unable to predictively link individuals to the 9/11 attacks prior to the incident (White 2006).

The Director of National Intelligence (DNI) and DoD defines OSINT as, "Intelligence produced from publicly available information that is collected, exploited, and disseminated in a timely manner to an appropriate audience for the purpose of addressing a specific intelligence requirement" (Kingsbury 2008). OSINT views a wide array of sources to include media such as radio, television, and newspapers; public data such as hearings, budgets, and press conferences; the internet and user-developed entities such as social networking sites, blogs, wikis, and chat rooms; observation and reporting such as airplane spotters and Google Earth; and professional and academic products such as studying, findings, papers, and conferences.

Significance of this Study

A sleeper cell, or a clandestine cell, is a secret organization that remains hidden within a target population until they have reason to act (Wikipedia 2011a). The characteristic of sleeper cells that makes them particularly elusive to analysts is their lack of overt communication. However, a critical vulnerability of their communication is their social contacts and interactions when related to nefarious activities. A better illustration would use the colloquial term 6 Degrees of Kevin Bacon (The Oracle of Bacon n.d.). While you may not have direct dealings with Usama Bin Laden, a friend of a friend of a friend just might. To over simplify a point, social networking illustrates these varying degrees of separation. OSINT often attempts to discern patterns in public information to help define networks, in order to establish exploitable links. The thesis will demonstrate the power of social networks to glean information from any organization, regardless of its character.

Predictive analysis is, simply stated, using what we know about the past to predict what will happen in the future. Data mining is one tool used in predictive analysis. Data mining attempts to reduce a large and unmanageable amount of information into a practical resource (Boorman 2011). Analysts are able to extrapolate probable future events by searching for patterns, trends, or even the actions of one individual. The potential for data mining of social networks has increased with the rapid growth of the number of individuals using social networks. Once considered solely as a means to broadcast to users, social networks now represent a vast resource of information in a database ripe for data mining (Boorman 2011).

The purpose of predictive analysis is to change information into actionable intelligence. Actionable intelligence is data relevant to a problem that allows the consumer of the information to make a decision or take action. Predictive analysis is used in several areas of military intelligence, finance, business, and even medical studies.

Two terms that are closely related are social network and social networking. A social network is a social structure made up of individuals or organizations connected by a commonality such as friendship, relations, beliefs, finances, as in a church organization or a book club (Hartshorn 2010). Social networking is an online service, platform, or site that focuses on building and reflecting social networks and relations of people who share common interests or activities. Common examples of American social networking are Facebook, MySpace, Twitter, and YouTube. One example of social networking that uses predictive analysis to produce a desired end state is barcode technology (Essam 2008). Retail stores use a customer's purchase history to forecast future purchases in order to stock shelves, plan sales, print coupons, and increase profits. Additionally, the term social media is often interchangeable with social networks. The main difference between the two terms regards social media as a broadcasting tool and social networks as a communication tool (Hartshorn 2010).

Restrictions and Limitations

In order to better focus the research, there were some restrictions. This study did not explore the ethical and legal implications of The Patriot Act, potential civil rights violations, or EO 12333 and EO13355 intelligence collection restrictions on U.S. citizens. Also, this study did not attempt to explain the technical aspects of social

networking such as computer programming language, hardware, bandwidth, or server capacity.

This study initially proposed to examine social data regarding the 9/11 terrorists that was publicly available before the attacks. This study at the outset proposed to demonstrate how social networking lent itself to analysis by connecting publically available data. The public data should have allowed analysts to make inferences and extrapolate conclusions. During the research process, applying existing technology to past events proved unnecessary as newer, real-world events better demonstrated the thesis proposal.

Since many terrorists often work for non-state actors, traditional military analysis such as Order of Battle and Country Studies, cannot achieve viable predictive analysis for their potential actions. Terrorists hidden in sleeper cells are almost invisible to traditional disciplines of intelligence collection. Commercial off-the-shelf applications, shareware, and free services, such as Facebook, MySpace, Twitter, YouTube, and Bar Code Readers, could have direct application for DoD, law enforcement, and the Department of Homeland Security (DHS). Systems that automatically generate links between persons of interests via social networking mediums could lead to actionable intelligence. The application of social network analysis could become a discipline within Military Intelligence alongside Signals Intelligence (SIGINT), Human Intelligence (HUMINT), and Measurement and Signature Intelligence (MASINT), or simply embedded within existing OSINT operations. The ultimate goal of this study is to describe social network tools that are relevant for today's analysts and demonstrate their effectiveness to produce change and solve problems.

Structure of the Paper

This chapter establishes the foundation of the thesis. It introduces the relevant topics and explains their significance to the problem. Additionally, this chapter discusses certain parameters and limitations of the study. A glossary at the end of the paper defines many of the new digital platforms and terminology discussed at length through the study.

Chapter 2 describes the thoughts and theories of the prevailing industry experts. Subjects range from crowdsourcing, to marketing, to leaderless organizations. Chapter 2 also describes the efforts of early pioneers in crowdsourcing and social networks. Additionally, Chapter 2 addresses a few initial U.S. Government efforts within the topic of study.

Chapter 3 describes the case study methodology used through the research for this project. Chapter 4 compares and contrasts multiple social networks and their involvement in several real-world events. Lastly, Chapter 5 addresses the research results, notes several unexpected findings, and suggests ideas for future studies.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study is to determine the feasibility of applying assets and technologies available to present day analysts, specifically the linkages created through social networking, to solve problems. An influential author and Middle East expert, Peter Bergen, called for the application of social networking to assist in protecting America from terrorism in a 2007 article. He proposed the intelligence community ought to build a social networking database to track terrorists funneling in and out of Iraq (Bergen 2007). While terrorism continues to emerge from more areas of the world than just Iraq, his idea still holds merit.

Chapter 2 is organized into three basic categories: the experts, the proponents, and early DoD actions. The experts are individuals that champion the use of social networks as a collaborative tool for users to produce change at any level, large or small. The proponents are agencies or publications that have challenged the public to solve problems using social networks as the primary collaborative tool. Lastly, without overlapping with the Chapter 4 analysis, there were some early inclinations of DoD showing interest in social networks as an analytical tool prior to 2010.

The Experts

Clay Shirky, a social media theorist, is one of the world's leading advocates for the useful application of social networking to solve problems. Shirky is an adjunct professor in New York University's graduate Interactive Telecommunication Program. His online profile states, "Clay Shirky's work focuses on the rising usefulness of decentralized technologies such as peer-to-peer, wireless networks, social software and

open-source development” (Shirky, ClayShirky n.d.). Shirky believes new technologies enable new kinds of cooperative structures to flourish as a way of getting things done in business, science, the arts and elsewhere, as an alternative to centralized and institutional structures, which he sees as self-limiting. Shirky advocates the power of collaboration among common users, not associated by governments or large organization. Social networks act as the platform for these collaborative efforts. Shirky hypothesizes that as more people adopt simple social networks to increase the speed of their communications, the speed of the collaborative group’s action will directly increase as well (Shirky 2008, 161).

Shirky presented his ideas to the TED forum on three separate occasions. TED is a non-profit organization devoted to “Ideas Worth Spreading” that focuses on Technology, Entertainment, and Design (TED n.d.). Shirky’s first TED address occurred in Oxford, England in July 2005. He compared the power of collaborative groups as opposed to institutions as a preferred method of arranging group output (Shirky 2005). The classic method for group organizations is an institution. However, all institutions incur coordination costs. Institutions require managers to direct the group. Institutions require economic, legal, and physical structures. Lastly, institutions are inherently exclusionary. Shirky proposes that collaborative groups can achieve the same results as expensive institutions, without the excessive costs and burdens (Shirky 2005).

Shirky’s primary example of collaborative power is Flickr, the online photo sharing service (Shirky 2005). Flickr uses a social bookmarking function called tagging to allow user to classify and title their photos themselves. Shirky explains that tagging is a cooperative form of infrastructure. Flickr has turned over the management of this

company, for lack of a better word, to the costumers. Flickr has no need of institutional requirements; therefore, it has greater flexibility without its rigid constraints.

Shirky's collaborative group proposal directly relates to leaderless organizations or groups with decentralized control. He directly relates the interworking of terrorist cells to a collaborative group using the 9/11 hijackers as an example (Shirky 2005). Non-state actors such as terrorists routinely operate in collaborative forums to recruit, share information, and execute plans. Shirky uses this example to demonstrate that collaborate groups don't always form for noble causes.

Shirky's second TED event occurred when he addressed the U.S. State Department in June 2009, where he specifically addressed how social media could change history. Shirky illustrated four media innovations that revolutionized the world before the invention of the Internet (Shirky 2009). The first innovation, the printing press, allowed one person to communicate with the masses (Shirky 2009). The second innovation was two-way communication in the telegraph and telephone (Shirky 2009). These devices allowed two people to converse with one another. The third innovation was recorded media other than print (Shirky 2009). It included photographs, recorded sound, and movies. Again, these types of media facilitated one-to-many communication. The fourth innovation harnessed the power of the airwaves with radio and television, another one-to-many communication method (Shirky 2009).

Prior to the Internet and, more specifically social media, communication was very limited. Conversations were restricted between two people and when addressing groups everyone received the same message. The first four media innovations could support the message or the group, but not both. However, social media and social networking has

changed this dynamic. The fifth innovation, the Internet, has proven to be the most powerful revolution yet. The world is no longer restricted to one-to-one or one-to-many communication. Now many-to-many is possible. The Internet has almost completely absorbed the previous four innovations as it is the digital carrier for all other media. Lastly, and perhaps most importantly, the Internet has transformed the audience as the consumers are now also producers.

Shirky uses the 12 May 2008 Sichuan province earthquake in China to demonstrate the power of social media to first, second, and third order effects (Shirky 2009). The tragedy that resulted in over 68,000 deaths proved to be a significant political problem for the Chinese government because of their inability to limit the flow of information into, out of, and throughout their country. The first stage occurred within minutes of the earthquake when citizens began texting, tweeting, photographing, and filming the event, mostly with mobile phones (Shirky 2009). BBC and the U.S. Geological Survey agencies learned of the event from Twitter minutes before any official news report. The second stage occurred within a half a day as donation websites appeared in online communities throughout the world (Shirky 2009). The third stage occurred a short while later via citizen journalists. Parents in the Sichuan province learned the school buildings that their children perished within were not built to code because of corrupt officials taking bribes during construction (Shirky 2009). The resulting protests were so massive and focused, the Chinese government was forced to shut down media coverage to prevent additional protests elsewhere in the country.

China quickly learned of the evolution of media and the lack of power to control it. In the past, media was produced by professionals, came mostly from the outside world,

came in relatively spare chunks, and came relatively slowly (Shirky 2009). Now media is produced locally, produced by amateurs, produced quickly, and produced in abundance. China reportedly shut down access to Twitter in anticipation of the 20th anniversary of the Tiananmen Square protests of 1989 (Shirky 2009). Without the power to filter the information, their only recourse was to completely block it all.

Shirky concluded by summarizing the power of today's social media as global, social, ubiquitous, and cheap (Shirky 2009). However, the new abundance of media and its accessibility is not its most powerful attribute. Now the audience is able to talk back and with each other and collaborate. Social networking has forever changed the way the world communicates.

Shirky's third and most recent TED event occurred in Cannes, France where he explained his concept of cognitive surplus. He estimates the world possesses a surplus of over a trillion hours a year of free time. Now with the power of social media tools, people can be more than just consumers. Shirky's concept of cognitive surplus is the ability of the world's population to volunteer and contribute and collaborate on large, and sometimes global, projects (Shirkey 2010). The best example of the practical application of cognitive surplus is Ushahidi. Ushahidi is a website that uses crowdsourcing to collect data from regular people to create a common picture. Ushahidi was created after the controversial Kenyan presidential election in 2007 to collect eyewitness reports of violence (Hersman 2009). It has since been used in a number of differing ways from collecting snow removal data in New York to monitoring Atlanta metro crime to monitoring post-earthquake crisis response in Haiti. Ushahidi is very representative of the power of social media discussed in Shirky's three TED addresses: the power of

collaborative groups, the importance of social media to effect change, and the potential of cognitive surplus. Chapter 4 further explains Ushahidi's capabilities.

Besides Clay Shirky, another influential advocate of social networks as a medium to enact change is David Meerman Scott. Scott coined the term "World Wide Rave" when explaining the power of social media to broadcast messages. Intended primarily for business entrepreneurs, a World Wide Rave is a six-step marketing campaign engineered to expand virally, with very little cost to the announcer (Scott 2009, 5-6). Scott illustrates the power of the Rave with the story of Cindy Gordon, the vice president of marketing at Universal Orlando Resort. Instead of spending millions of dollars to advertise the opening of the new Harry Potter theme park using Super Bowl ads, blimps, mailings, and magazine ads, she sent notification to seven individuals via Twitter. Those seven people told others, who told others, who also told others. Mainstream media eventually learned of the news and reported about it in their newspapers, in magazines, on television, on radio, and in blogs. Gordon estimates that eventually 350 million people heard her original announcement, after just telling seven people. Scott describes this phenomenon as a World Wide Rave (Scott 2009, 6).

Scott defines social media as a way people share ideas, content, thoughts, and relationships online (Scott 2010, 38). It differs from mainstream media in that anyone can create, comment, and add to content, in the form of text, audio, video, images, and communities. Scott likens social media to a cocktail party, given its informal personal interaction (Scott 2010, 39). A small conversation using a social media platform has the potential to reach hundreds, thousands, and even millions.

The last theory that influenced this thesis regards leaderless organizations. The power of crowdsourcing relies on its collaborative prowess (Carpenter 2010). However, there is a unique trait of a crowd focused on solving a problem through collaborate means. Most large-scale collaborative groups are motivated by their interest in a particular cause or problem set. They are not driven by a hierarchical task master. Collaborative groups are more-or-less self-sustaining. The concept behind this phenomenon is the Starfish and the Spider, described in a book by the same name. The analogy states that if you cut off the head of a spider, it will cease to function and it will die; if you cut off the leg of a starfish, it will regrow and the animal will survive (Brafman and Beckstrom 2006, 34-35). Collaborative organizations, especially those linked together via social networks, mimic the survivability of the starfish in the story. While overly simplified, the starfish concept explains the power of the crowd. It produces results of its own volition, without a designated leader providing motivation.

The war on terror in Iraq and Afghanistan has demonstrated that U.S. Army doctrine must evolve to counter decentralized and networked threats. At the urging of senior leadership in 2010, the U.S. Army began several pilot programs called The Army Starfish. Involving a collaborative effort between Ori Brafman, co-author of “The Starfish and the Spider,” and the U.S. Army’s Training and Doctrine Command (TRADOC), the program aims to train leaders to think, act, and operate more decentralized (Dempsey 2010).

The Proponents

The “Ten Red Balloons” and “Vanish Competition” case studies perfectly illustrate the effectiveness of using social networking to accomplish a goal. In the balloon

project, DARPA, the Defense Advanced Research Projects Agency, floated ten 8-foot red balloons at fixed locations around the country and offered a \$40,000 prize to the first team to locate them all (Jones 2009). DARPA, expecting the competition to last over 2 weeks, was shocked when a team of MIT students found all 10 balloons in less than 9 hours. The MIT team harnessed the power of the Internet, Twitter, and Facebook to propel themselves to victory with less than a week of planning. In the vanishing competition, Wired Magazine published an article by Evan Ratliff, who engineered a similar \$5,000 competition using himself as the lost artifact (Ratliff 2009). He disappeared by changing his identity, severing all social connections, and moving about the country. A team found Ratliff in 25 days in New Orleans by using social networking sites to discern his whereabouts (Ratliff 2009). The possible DoD applications demonstrated by these examples could be substantial. Imagine a million-man army of analysts using social networks to find a high-profile terrorist just like the group looking for giant red balloons.

Early DoD Actions

The classified USSOCOM project called Able Danger purported to use public information to track terrorists who later were involved in the 9/11 attacks. However, since their project was deemed illegal, and its results ordered destroyed for privacy act violations and intelligence gathering restrictions, its value and effectiveness cannot be ascertained (White 2006). Also, it is unlikely their data mining methods of connecting classified and unclassified information included using social networking mediums. Social networks were not embraced on a large-scale for several years after 9/11, as described in chapter 4.

The concept of using social networks by DoD personnel to produce change later appeared in an award winning military institute paper in 2010. U.S. Army Major Christopher Ford, in an essay contest for the Naval Postgraduate School Center for Homeland Defense and Security, proposed a simple website integrated with social networking sites that used a cash reward system to solve problems (Ford 2011). He used the “10 Red Balloons” and “Vanish Competition” as prime examples for his validation. Both examples clearly show successful end states through the proper application of social networking to produce results.

Social networking is still a relatively new technology. The analytic applications of social networking could be unlimited. This study may be able to provide more suggestions of its application and potential by describing real-world examples. This thesis could prove beneficial to DHS by describing new ways to hunt terrorists around the world with the power of social networking. Social networking is often free-of-charge, used by millions, and is global. Social networking is a growing field, limited only by its users’ imaginations.

CHAPTER 3

RESEARCH METHODOLOGY

Purpose

The purpose of this study is to determine the feasibility of applying assets and technologies available to present day analysts, specifically the linkages created through social networking, to solve problems and enact change. Chapter 3 presents the methodology used to research and analyze the problem. Using case studies to compare and contrast the application of social networks to affect real-world problems, this study will determine the feasibility of using today's technologies to assist analysts.

Case Studies

Case study research involves the study of an issue explored through one or more cases within a bounded system (Creswell 2007, 73). The research for this topic originated from a wide varying of sources and provides in-depth details. The methodology for this research uses a collective case study approach, where multiple case studies illustrate a single issue (Creswell 2007, 74). This collective study uses both small-scale and global-sized cases.

As there are several case studies of social networking being used to solve unique problems, I originally planned to apply social networking capabilities to events predating the 9/11 attacks. This did not occur. As the field of social networks expanded at an almost exponential rate over the past year, the feasible of using social networks to solve problems no longer needed to be applied to a past problem. Social networks are already

used to solve current problems that illustrate their feasibility as an analytical tool. The research was no longer dependent upon the 9/11 attacks to serve as a model.

Additionally, the research approach intended for this thesis greatly altered throughout its evolution. The original research questions proved to be too divergent to be considered in a single research project. Instead of describing the dynamics between social networks, the 9/11 terror attacks, and current OSINT practices, the study's focus narrowed solely upon social networks, their capabilities, and their real-world application to evoke change.

Structure of the Paper

The structure of this paper allows the reader to follow the argument's logic. Chapter 1 explained the problem and its proposed solution. In the literature review, an information roadmap that answered the three research questions of this thesis presented itself by following the social media platforms of several subject-matter-experts. For example, Twitter and Facebook pointed toward news reports and specific blogs that demonstrated the power of social media. Anecdotally, news of Usama Bin Laden's (UBL) death on 1 May 2011 drove user interaction on Twitter to record numbers. Users sent an average of over 3,000 tweets per minute and peaked at almost 6,000 tweets per minute during that time, totaling almost 40 million tweets in just less than four hours (Tsotsis 2011). Most of the UBL tweets linked to news blogs and websites for further details. Second Screen examples such as this, when events inadvertently create a surge of user participation, were not available when the research for this thesis began over seven months ago (Gross 2011).

Chapter 3 describes the research methodology proposed for the study, while chapter 4 provides the application of varying case studies to answer the primary research questions. Using social networks and their links to supporting information proved critical in the research for this thesis. Collaboration became apparent as user ideas were shared and propagated across multiple social network platforms. As chapter 4 will demonstrate, social networks proved extremely useful as a tool to solve problems or enact change, especially when two or more networks were applied to the same problem. While not the sole proponent for action, social networks clearly established themselves as practical tools of collaborative communication.

Chapter 4 utilizes two tables to compile collected data for analysis. Table 1 compares the capabilities of twelve distinct social networks. Table 2 compares six real-world case studies in terms of weapon, threat, or target. Finally, chapter 5 offers analysis and conclusions, describes certain unexpected findings, and suggests ideas for further studies.

Table 1. Compilation of Prominent Social Network Capabilities, Blank Chart

	Information Sharing	Location Sharing	Business Professionals	Video Sharing	Photo Sharing	Purpose Driven
Facebook						
MySpace						
Twitter						
Foursquare						
Google Maps/Earth						
LinkedIn						
YouTube						
Flickr						
Ushahidi						
CrowdMap						
CrimeMap						
CrisisMap						

Source: Created by author.

Table 2. Case Study Comparison, Blank Chart

	Weapon	Threat	Target
Facebook			
Snowmageddon			
Tunisia			
Egypt			
Libya			
Obama Campaign			

Source: Created by author.

CHAPTER 4

ANALYSIS

The purpose of this thesis has always been to prove the utility of using social networks to assist analysts fight terrorism. The original research plan called for the answering of three questions. How do social networks create linkages? What was the publicly available data regarding the 9/11 terrorist prior to the attack on the World Trade Center? How do U.S. intelligence analysts use OSINT? During the course of the research needed for the thesis, two of the three primary research question greatly altered. While still focused on the application of social networks, the new questions were more closely related as the originals proved too divergent. The final direction of the new questions led to a more logical study of the information available.

Chapter 4 is a collective case study, organized by three research questions. The first research question, how do social networks create linkages, describes the several subcategories of social networks and their capabilities. The second research question, how have social networks been used to solve small problems, discusses the application of social networks to solve real problems at an individual and small-organization level. The third and final research question, how have social networks been used to enact large-scale changes, discusses world-changing events from the past three years powered by social networks.

How do Social Networks Create Linkages?

As of February 2011, Wikipedia lists over 200 social network sites ranging in topics from business (such as LinkedIn, MeetTheBoss, and PartnerUp) to religion (such as Muxlim, MyChurch, and Cross.tv) to music (ShareTheMusic, ReverbNation, and

Playlist) to pop-culture (Buzznet, HubCulture, and Vampirefreaks) (Wikipedia 2011b). The list of sites covers vast topics and continues to proliferate. Wikipedia lists 13 social network communities with over 100 million active users, an increase of over 20 percent since the research for this thesis began ten months ago (Wikipedia 2011c). The following discussion of available social networks is categorized as information sharing, location sharing, business networking, video sharing, photo sharing, and purpose-driven.

Information Sharing

Facebook

Facebook is a free-of-charge social networking website developed in 2004 for college students to share information among their self-generated virtual community (Social Media Defined 2008a). The site has only two restrictions for users: they must possess an email address and be at least 13 years old. Facebook provides each of its members a profile of their own to decorate and share as much or as little about their personal interests and life as desired. The profile is essentially an amateur personalized website, referred to as a wall, for its users that allows them to share information, photos, and dialogue. Photos, videos, text, and countless applications can be posted to personal profiles and the visibility of these items to other users is entirely defined by the owner (Social Media Defined 2008a).

The site possesses varying levels of privacy that allows the user to define their level of transparency to the general public. Profiles are searchable by any number of keywords, locations, or name searches. Users allow other users to view their information by becoming friends, which is Facebook's term for granting viewing access via deliberate invitation. Friends see profile updates on a summary page when they access the website

using their username and password. Although many people enjoy increasing their number of friends at random, the premise of Facebook is for people to connect with others that they know (Social Media Defined 2008a).

Walls may be visible to anyone in the Facebook community or to only persons known to the owner. Conversations between users may occur directly on someone's wall similar to posting a comment in an online news article for all to see, or they may be sent privately through an internal email system or an instant messaging service. Facebook allows multiple levels of communication: one-to-one (private messages), one-to-many (blogs), and many-to-many (wall updates). The tiered communications of Facebook greatly enhance its collaborative power. While a user might coordinate efforts to plan a surprise birthday party, the same could be said to achieve most any goal, like locating a person-of-interest.

Facebook easily integrates the functions of other social networks such as Foursquare and YouTube. These networks are described later in this chapter. This is important because the integration of several social networks into singular platforms greatly increases collaborative power.

Easily the largest and fastest growing social network in North America, Facebook has over 500,000 unique users visit its site every month (eBizMBA 2011). Third only to QQ, China's top social network, and Skype, an internet based phone communication platform, Facebook is expected to take the top spot within the next year. User profiles may represent individuals, organizations, or even companies as a whole. By 2015, Facebook should reach 7.5 billion users, exceeding the population of the planet (Kennedy 2010).

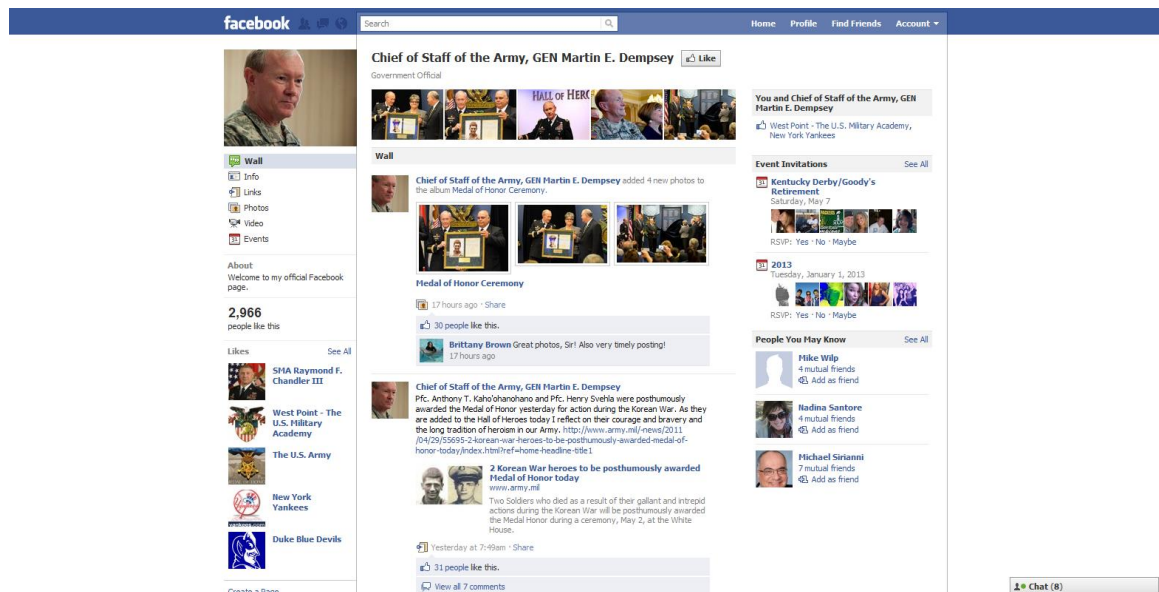


Figure 1. GEN Dempsey's Facebook page

Source: Facebook, "Gen Dempsey's Facebook Page," <https://www.Facebook.com/pages/Martin-Dempsey/104095336292736> (accessed 3 May 2011).

MySpace

MySpace is another information sharing social network, launched in 2003 for individuals to share information about the music industry. Specifically, the network allowed small, fledgling bands to disseminate their music and tour dates while interacting with their fans at a very personal level. The site was conceived in early 2002, about a year after the now little-used website Friendster attempted to accomplish similar connectivity between users (Douglas 2006). In 2006 MySpace was the king of all social networks, but it has since been dwarfed by the Facebook community. It is estimated that since 2008, MySpace loses 10 million users per month and consequently has lost a significant amount of its monetary value (Barnett 2011). While MySpace and Facebook have similar capabilities, such as messaging, personal profiles, friend connections, and

photo sharing, MySpace has devolved from a powerful social network into primarily just an entertainment information sharing network.

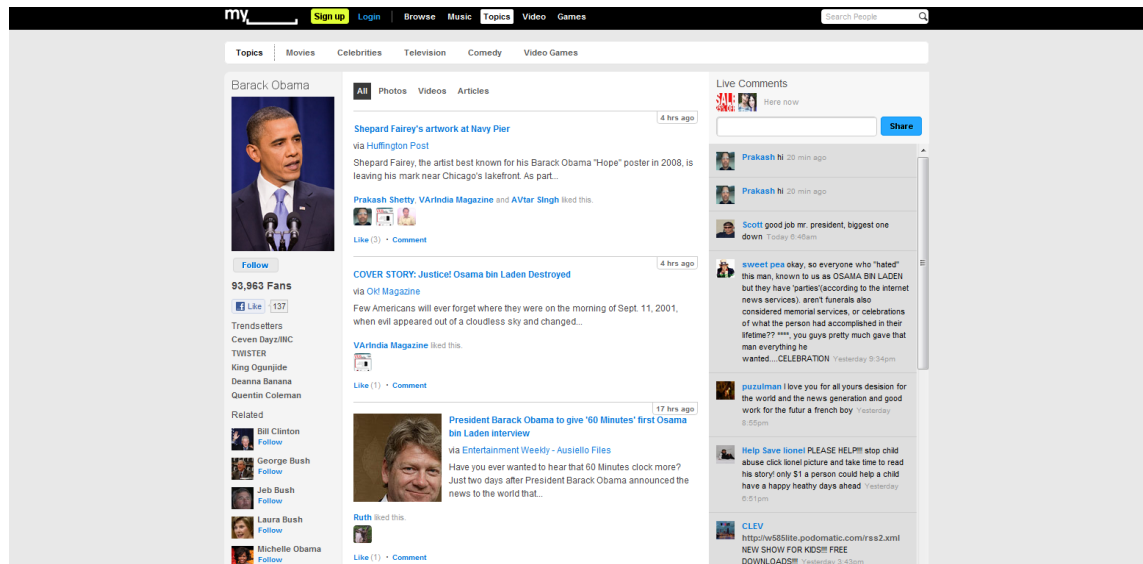


Figure 2. President Obama's MySpace Page

Source: MySpace, "President Obama's MySpace Page," <http://www.Myspace.com/barackobama> (accessed 3 May 2011).

Twitter

Twitter is a micro blogging application that is more or less a combination of instant messaging and blogging (Social Media Defined 2008b). The basic premise of the application is that users receive a customizable profile page and can send messages via a tweet, which are short updates of less than 140 characters that answer the question, "What are you doing?" These updates are then compiled on the profile of other users that decide to follow the updates. Twitter communication closely resembles cell phone texting. However, instead of communicating to just one person, Twitter sends the

message to whoever has subscribed to the follow the author's tweets. Twitter transforms texting from one-to-one communication into one-to-many communication.

Conceived by programmer Jack Dorsey in 2000 and launched in 2006, the site that has over 200 million users claims to not have reached even 1 percent of its potential (Taylor 2011). In the second half of 2010, Twitter saw users increase by 50 percent. 83 percent of that surge related to increased international users (Taylor 2011). The growth of Twitter, while not as strong as that of Facebook, continues to proliferate. However, in direct contrast to Facebook, no other social network immerses the user into the global conversation as completely as Twitter. Twitter estimates of its 200 million users, only about 20 million are considered to be serious users (Hempel 2011). Twitter was never designed to support such a large network, even one that only handles serious interaction from 10 percent of its population. In its early years, Twitter was known for crashing due to user overload. The problem is less of an issue recently as the company greatly enhanced its server capacities.

Users decide who to receive updates from, by following them. Following is the Twitter term for subscribing to another user's data stream. Users can use Twitter to ask general questions of their followers, share links to favorite websites and blogs, or just to keep others informed on daily activities. Following allows users access to vast amounts of real-time data from personal tweets from coworkers and friends to breaking news from CNN or even something as pedestrian as new menu items at a favorite restaurant (Social Media Defined 2008b).

Twitter has significant value for professionals and is already being used by thousands of organizations around the world (Social Media Defined 2008b). With

Twitter, businesses can update their customer-base about new happenings and events, ask for feedback, share links in order to direct traffic back to their website, communicate with employees, expand their brand, and much more. Twitter is a free-of-charge and effective way for companies to engage current and prospective customers and gives organizations a greater degree of approachability.

Twitter quickly defined its role within media due to its ability to allow immediate live coverage of news events. Using Twitter, someone can tweet from inside an exclusive event and keep the outside world up to date with what's happening just seconds after it happens. In 2009, Twitter was named the number one web product of the year by an online polling campaign (MacManus 2009). It is one of the fastest growing social networks and continues to amplify its impact upon the digital world.

Twitter redefines how individuals communicate with each other. Twitter has made the fast flowing information super highway even faster (Gross 2011). Since Twitter allows users to communicate directly with one another, there is no longer a need to filter information through editors or reviewers before its release. Twitter has inadvertently created digital leaders capable of influencing thought. While most of the top 100 most popular Twitter feeds belong to celebrities and traditional media outlets, the next tier is ripe with bloggers, podcasters, and online journalists capable of disseminating their agendas to massive, receptive audiences (Gross 2011).

Twitter created a phenomenon called Second Screen as well. When popular events occur, real-time chatter between millions of fans creates a spike in the use of the social network. For example, during the broadcast of the highly watched television program Glee, Twitter traffic increases by a factor of 30 (Gross 2011). In another

example, during last year's Super Bowl, over 4,000 tweets were sent per second (Gross 2011). In essence, Twitter became an alternative to the television screen as a way to monitor these events, hence the term Second Screen.

Lastly, Twitter has oversimplified our conversations. Some critics argue that the 140-character limitation has dumbed-down conversations that deserve more context (Gross 2011). High profile individuals, such as politicians, feel it is acceptable to send limited information updates via Twitter because it alleviates the need for them to fully explain their messages or to endure follow-up questions. Presidential hopeful, Newt Gingrich, received condemnation within 24 hours of announcing his campaign bid via Twitter 11 May 2011 as critics felt the social media platform was not an appropriate method for such a news release (Borger 2011).

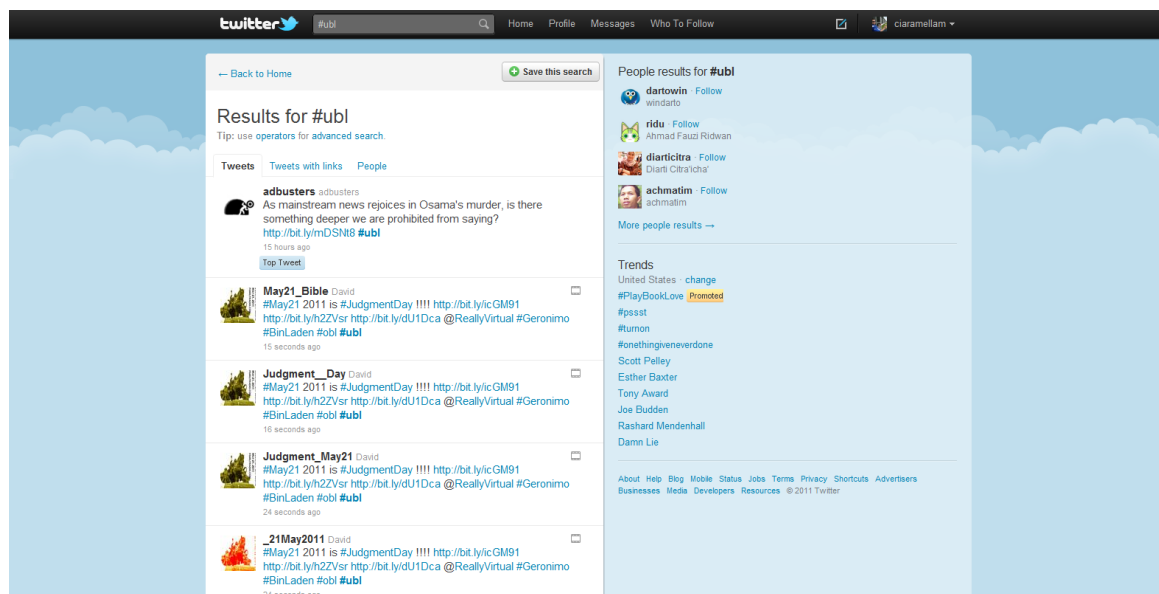


Figure 3. UBL Twitter Feed

Source: Twitter, "UBL Twitter Search," <http://Twitter.com/#!/search/UBL> (accessed 3 May 2011).

Wiki Websites

While technically not a social network because it fails to link its users to one another, Wiki websites possesses similar collaborative traits. A wiki is a website that allows the creation and editing of any number of interlinked webpages via a web browser using a simplified text editor (Wikipedia 2011d). Wikis serve as collaborative platforms for multiple users. Some well-known wikis include Wikipedia, WikiLeaks, and MilWiki. The individual users add, delete, and update the information contained within a wiki, rather than a proscriptive group of gatekeepers. The wiki users themselves serve as the site editors.

Location Sharing

Foursquare

Foursquare is a relatively new location-based social network. Developed in 2009, the service is available to users with GPS-enabled mobile devices, such as iPhones, Android mobile phones, and Blackberries. Users check-in at venues using a mobile website, text messaging or a device-specific application by running the application and selecting from a list of venues that the application locates nearby. In lieu of a full-fledged social network, Foursquare incorporates a gaming element, awarding users with points and merit badges for checking in at a variety of locations (Kincaid 2009). Foursquare differs from Facebook's location sharing capability by serving as a fully functioning collaborate effort to share data regarding specific geographic areas.

Foursquare allows users to share information specifically linked to locations. Users might share tips regarding drink specials, poor restaurants reviews, or unadvertised sales. However, what is most important is the system develops and maintains a dynamic

archive that builds a database regarding a fixed location. While primarily used as a travel guide, this virtual community is perfectly suited to monitor any activity in a given area.

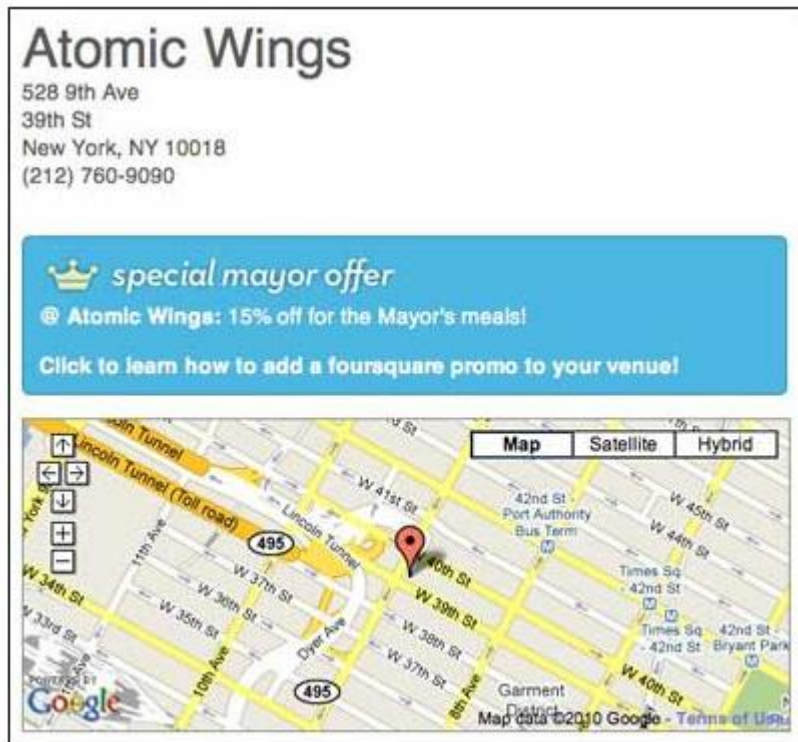


Figure 4. Foursquare Example

Source: Foursquare, "Foursquare Image Search," <http://64-56.com/NaplesCommonSense/2010/04/19/great-Foursquare-article-from-jack-aaronson/> (accessed 3 May 2011).

Google Maps and Google Earth

While technically not social networks, Google Maps and Google Earth have greatly enhanced the world of social media by creating a tether between the virtual world and the physical world with its inherent ability to provide immediate geographic context to users. Google Maps is a map and directions website from Google that provides turn-by-turn directions to a destination along with 2D satellite and 3D earth views (PC

Magazine n.d.). Google Earth possesses the capability to provide actual photographic views of the turns along real streets and their surroundings. Google Maps and Google Earth further enhance user connectivity given its availability through most smartphones. Both Google services are able to use the phone's GPS capability in conjunction with cellular and Wi-Fi location finding services to triangulate global positioning. The power of Google Maps and Google Earth lay within its ability to connect a user to a piece of desired terrain.

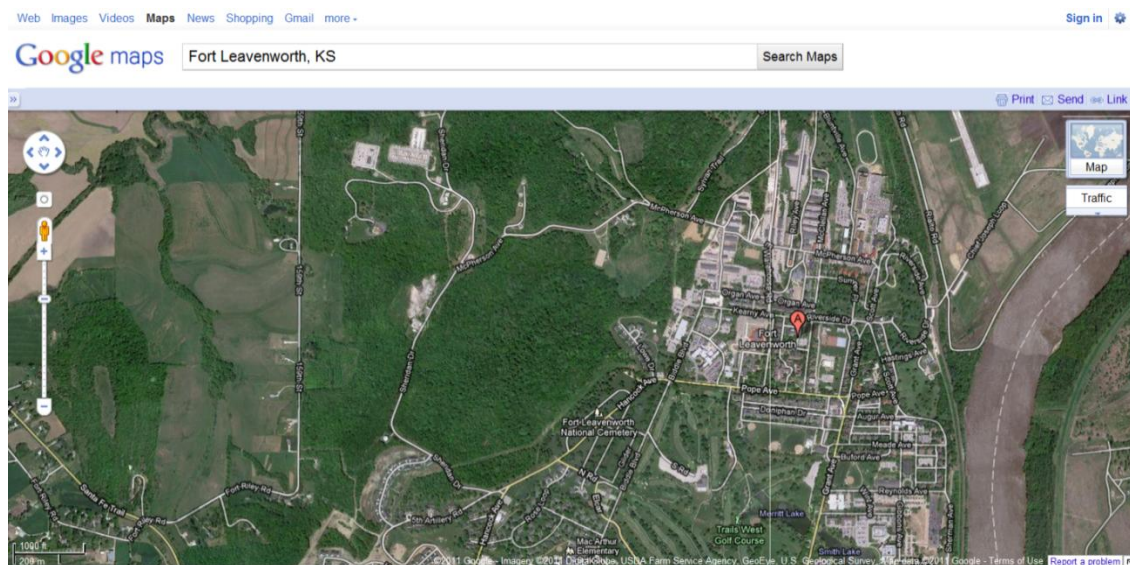


Figure 5. Google Map Fort Leavenworth, Kansas

Source: Google Maps, “Google Map Search of Fort Leavenworth, KS,” <http://maps.google.com/maps?hl=en&tab=wl> (accessed 3 May 2011).

Business Networking

LinkedIn

LinkedIn is a professional social network with users from over 200 countries and executives from every Fortune 500 company (Social Media Defined 2009b). With more

users than any other professional social networking site, LinkedIn is a formidable place to build, maintain, and track professional contacts. In addition to management of personal contacts, LinkedIn is an effective means of self-promotion, providing users space to maintain a dynamic and public resume of work and educational experience.

The main feature of LinkedIn is the user's public profile, consisting of any work experience, education, specialties, or interests the user wishes to share. Others can view profiles to see common contacts, request contact introduction via email through another user, contact a specific user directly via email, or make work recommendations (Social Media Defined 2009b). Similar to most other social networking sites, users can create or join groups that interest them. Groups facilitate the sharing of contacts, geography, or work history.

Users can look up a particular company and view a number of fascinating statistics about the business, including which employees are on LinkedIn, what their titles are, age and gender ratios, which employees are within the user's personal network, common job titles, employees that recently left the company, and more.

One of the more unique functions of LinkedIn that separates it from other social networks, users can also see how many degrees of separation exist between them and others within the system (Social Media Defined 2009b). For example, the number 1 means that you are connected, number 2 means the person is connected to one of your personal connections, and so on. Additionally, users can view which contacts they share in common with other users, see any updates that their contacts have made to their profiles, and search for people by any number of keywords, titles, industry, and more. The advanced searching capabilities of LinkedIn make it a formidable tool for finding

jobs, business partners, employees, and valuable information about businesses. However, its design suggests the platform could be used as a serious tool for analysts looking to create linkages between known persons.

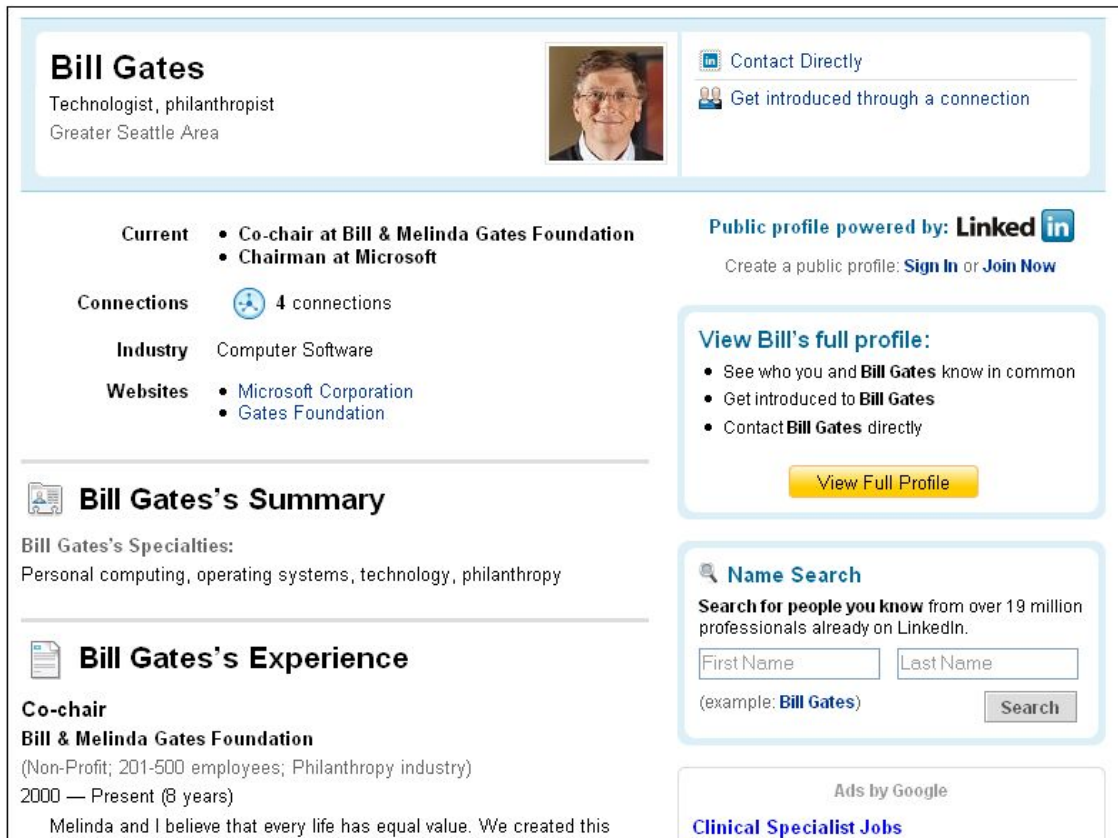


Figure 6. Bill Gates' LinkedIn Profile

Source: LinkedIn, "Bill Gates' LinkedIn Profile Search," <http://www.linkedin.com/in/billgates> (accessed 3 May 2011).

Video Sharing

YouTube

YouTube is a popular video sharing website that lets users upload short videos for private or public viewing. Founded in 2005 by Chad Hurley, Steve Chen, and Jawed

Karim, it was acquired by Google in 2006 for \$1.65 billion (Social Media Defined 2009a). YouTube provides a venue for sharing videos among known associates through a very loosely organized social network. It is estimated that more than 25 quadrillion bytes of videos are streamed, or viewed, from the site each month (Social Media Defined 2009a). The videos are conveniently shared by posting, emailing, or embedding the YouTube website link, rather than sending the actual video file that could be excessively large. YouTube supports AVI, MOV, and MPEG video formats from most digital cameras, camcorders, and mobile phones (Social Media Defined 2009a). YouTube converts all uploaded videos to a Flash video format that is common to most computer platforms to enable viewing from any computer regardless of the original file format.

The slogan of the YouTube website is Broadcast Yourself. The site acts as a massive database for users to store videos. The website is used all over the world by a vast demographic for personal and professional purposes. While several companies and organizations use it to promote their businesses, the vast majority of YouTube videos are created and uploaded by amateurs (Tech Terms n.d.). Some users post instructional videos, step-by-step computer help, do-it-yourself guides, and other how-to-videos. The real power of YouTube is its ability to quickly spread information to its consuming users. YouTube tracks the number of times a video is viewed, so it is easy to evaluate a video's impact. Once a video is viewed a large number of time, for example over 100,000 times, the video is said to have gone viral. A viral video is one that has spread much like a virus, quickly replicating itself as more and more users view it and instruct their associates to do the same (Feifer 2006). Viral videos are difficult to predict or engineer as they tend to proliferate with public sentiment or the daily news cycle. Whether the video is a cat

playing with a ball of string or an IED attack in Afghanistan, the speed at which the video can spread around the world is impressive. For example during the 2008 presidential campaign, videos of Barack Obama and John McCain were viewed more than two billion times according to media firm TubeMogul (PC Magazine n.d.).



Figure 7. YouTube President Obama Speech

Source: YouTube, "President Obama Announces Death of UBL," <http://www.youtube.com/watch?v=ZNYmK19-d0U> (accessed 3 May 2011).

Photo Sharing

Flickr

Flickr is an online community and photo hosting website that makes images easy to find and share. Housing several billion images, Flickr established itself as one of the most popular online place to upload and share photos and images since March 2005

(Social Media Defined 2009a). Flickr offers both free access, for limited uploads and photo sizes, and a fee-based service, for unlimited interface.

Once a user creates a basic personal account, they can provide as much or as little personal information as they wish to include in their personal profile and then begin uploading photos into their own photostream. To better organize and share photos, Flickr allows users to create sets, or categories, of their photos, such as sports, summer pics, or vacation photos. For any photo uploaded, users can also include specific tags or keywords to better define the image (Social Media Defined 2009a). These tags make it easy for anyone searching through photos on Flickr to find relevant images. As with most social networks, the user may adjust their level of privacy dictating who has access to their photos. Photos may be visible to the public at large or to a only select few individuals.

One particularly useful tool on Flickr is the Places Project, an initiative that allows users to upload photos of specific places anywhere around the world to a map. The map is easily searchable for anyone seeking photos of specific countries, cities, or even more specific locations. All a user needs to do is select the photos they'd like on the map and drop them in.

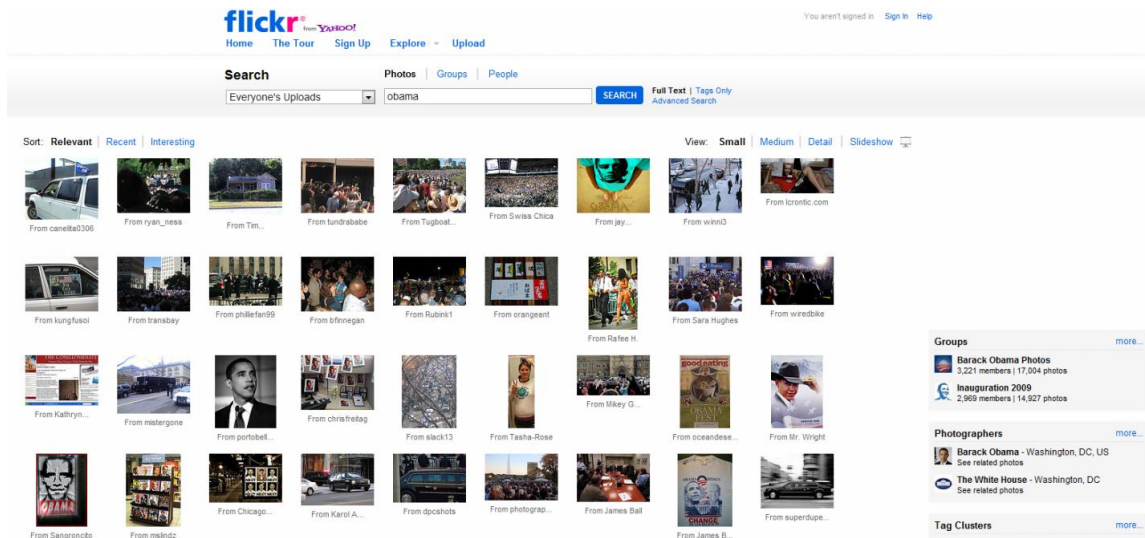


Figure 8. Flickr President Obama Search

Source: Flickr, "Obama Flickr Photo Search," <http://www.flickr.com/search/?q=obama&f=hp> (assessed 3 May 2011).

Purpose Driven Social Networks

The true power of social networks emanates from the concept of crowdsourcing. Crowdsourcing is the practice whereby an organization enlists a variety of freelancers, usually unpaid, to work on a specific task or problem. Most websites define crowdsourcing as the act of taking a job traditionally performed by a designated agent, such as an employee, and outsourcing it to an undefined, generally large group of people in the form of an open call (Crowdsourcing n.d.). Wired magazine introduced the concept to the general public in a 2006 article that likened the process to outsourcing jobs to India and China, except utilizing everyday people as a cheap labor pool using their spare cycles to create content, solve problems, and even do corporate research and development (Howe 2006). Crowdsourcing is similar to open source software development where the users themselves improve the program by writing better, more-efficient code. One of the

main benefits of using crowdsourced methods to solve a problem is its freedom from budgetary and physical constraints. Organizations could literally have hundreds of thousands of individuals focused on solving the same problem without providing them salaries, benefits, and office space.

Assuming the problem attracts support from people willing to volunteer their time and efforts, crowdsourcing poses a very viable option for many organizations. Some of the more successful crowdsourced social networks are the ones that tap into a population's need to participate. Social networks that attempt to solve community problems, rather than generate a profit, are more likely to attract willing and able users.

Ushahidi

Ushahidi is one of the earliest digital platforms for mass participation. According to their own website, Ushahidi is a non-profit tech company that develops free and open source software for information collection, visualization and interactive mapping (Ushahidi n.d.). The site was originally created in the aftermath of Kenya's disputed 2007 presidential election that collected eyewitness reports of violence sent by email and text-message and placed them on a Google Map. The programmers of the site based their model on the concept of crowdsourcing to pool user interaction to create a geospatial archive of events (Ushahidi n.d.). The act, since coined activist mapping, combines social activism, citizen journalism, and geospatial information. The data for the site streams from private citizens sent from mobile devices and along internet connections.

Ushahidi utilizes a software platform called SwiftRiver to power its website. SwiftRiver is the algorithmic tool that makes sense of data. In essence, SwiftRiver transforms information into intelligence. SwiftRiver is an open source software platform

that allows users to structure unstructured data, filter and prioritize information conditionally, and add context to content (Ushahidi n.d.). Using SwiftRiver, the user categorizes data sent via Twitter, email, or another web-based platform, assess its veracity and reliability, and then relate the information to a geospatial reference point in time.

The SwiftRiver platform is one of the first services to bring neogeography to the general public. Neogeography combines the complex techniques of cartography and GIS, or geospatial information system, and places them within the reach of users and developers (Turner 2006). This new science introduces users to a growing number of tools, frameworks, and resources that enable simpler map creations that share specific information to a network of individuals. Popular neogeography projects include creating genealogical maps with Google Earth animation to show family ancestry or sharing travel photographs organized by places visited.

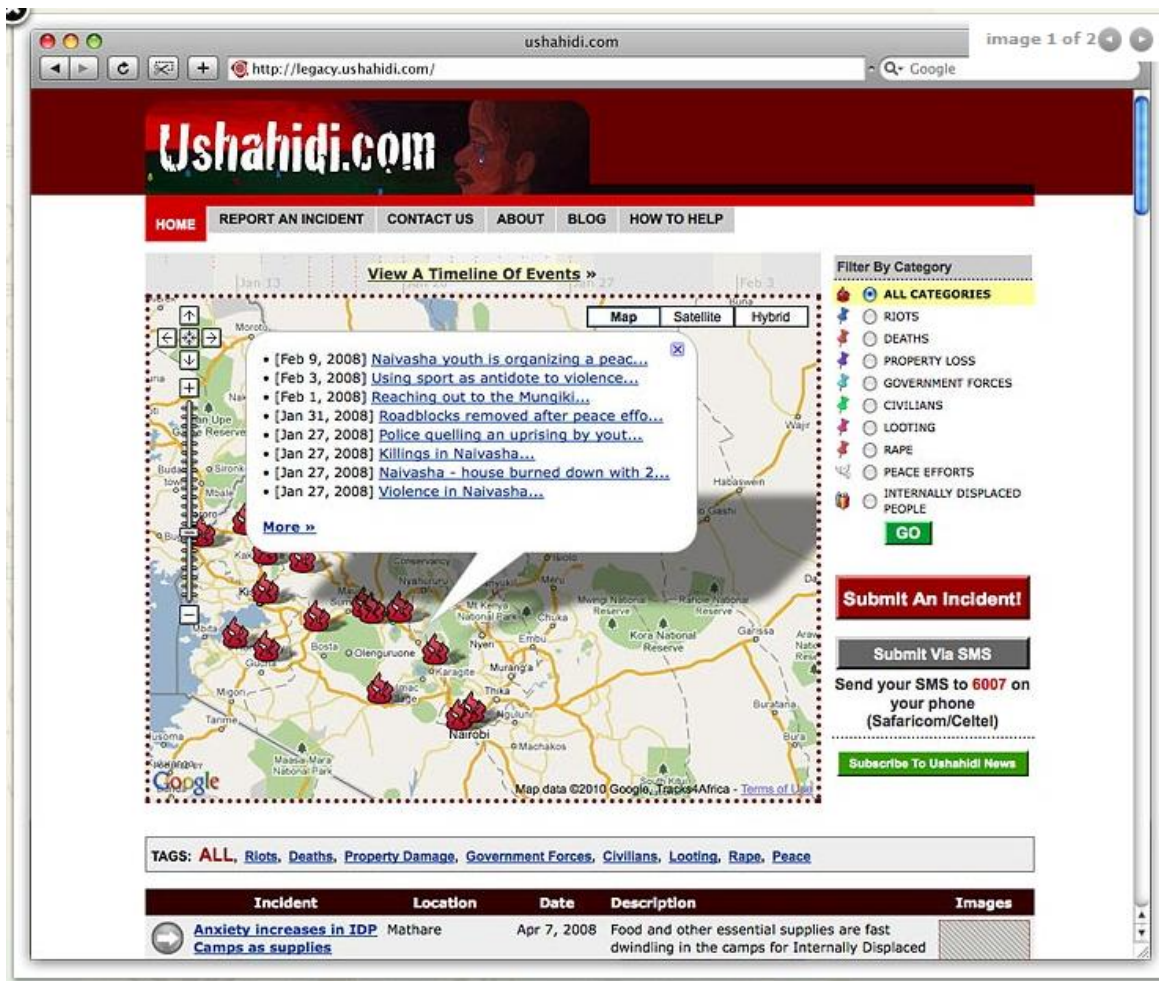


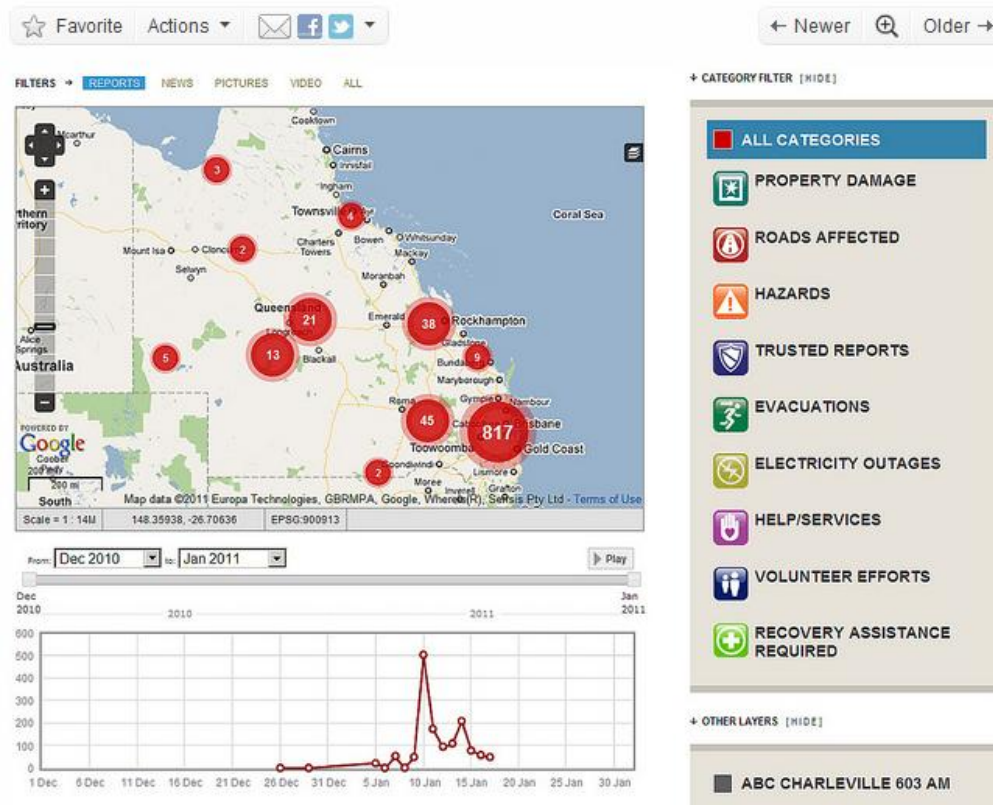
Figure 9. Ushahidi Original Design

Source: Ushahidi, "Original Ushahidi Webpage Design," <http://www.ushahidi.com/about-us> (accessed 3 May 2011).

CrowdMap

Since SwiftRiver software is a very technical platform and may be confusing to lesser skilled users, Ushahidi developed a similar software suite, but much simpler in design, called Crowdmap. Crowdmap software boasts a setup time of less than five minutes for any user that needs an open source mapping tool to create interactive maps for visualizing location-based data on a map and timeline (Patterson 2010). Using the

same Ushahidi design, the Crowdmapper tool crowdsources information via a web form, mobile phone, or Twitter.



ABC Flood Crowd Map

ABC Flood Crowd Map

Figure 10. CrowdMap Example

Source: Flickr, "Crowd Map Example Image Search," <http://www.flickr.com/photos/53424666@N08/5363140768/> (accessed 3 May 2011).

Crimemapping

CrimeMapping, a social network very similar to CrowdMap, offers specific and tailorable data management to its users. Developed by the Omega Group in 1992, CrimeMapping assists law enforcement agencies striving to provide the public with

valuable information about recent crime activity in their neighborhoods in North America (CrimeMapping n.d.). The goal of the network is to assist police departments reduce crime through a better-informed citizenry by creating more self-reliance among community members. The network extracts crime data on a regular basis from participating police and sheriff departments so the information available to the public through its web browser is the most current available (CrimeMapping n.d.). The data is verified for accuracy and properly sanitized to protect privacy concerns. The Omega Group, according to its website, views CrimeMapping's capability to provide intelligence solutions to policing as its contribution to national public service.

One component of CrimeMapping, CrimeView, is tailored specifically for law enforcement. The pay-for-use service promises updated data at least every 24 hours. Using a similar mapping engine as Ushahidi, CrimeView categorizes and geographically relates a vast bevy of criminal activities. The mapping engine plots the following incidents: arson, assault, burglary, disturbing the peace, drugs/alcohol violations, DUI, fraud, homicide, motor vehicle theft, robbery, sex crimes, theft/ larceny, vandalism, vehicle break-in theft, and weapons (CrimeMapping n.d.). The mapping engine also identifies locations where multiple crimes have occurred, illustrating the collaborative nature of the service.

Each incident is placed on a map using a unique symbol. The database is easily sortable through a provided search engine and may be tailored for large areas, such as an entire state, or as refined as a specific neighborhood. Depending on the size of the map used, the mapping engine will cluster similar incidents related by type, time, or proximity

to aid the user analyze the crime terrain. The engine sorts the data for trend analysis that could be used for pattern development to surge limited resources to solve problems.

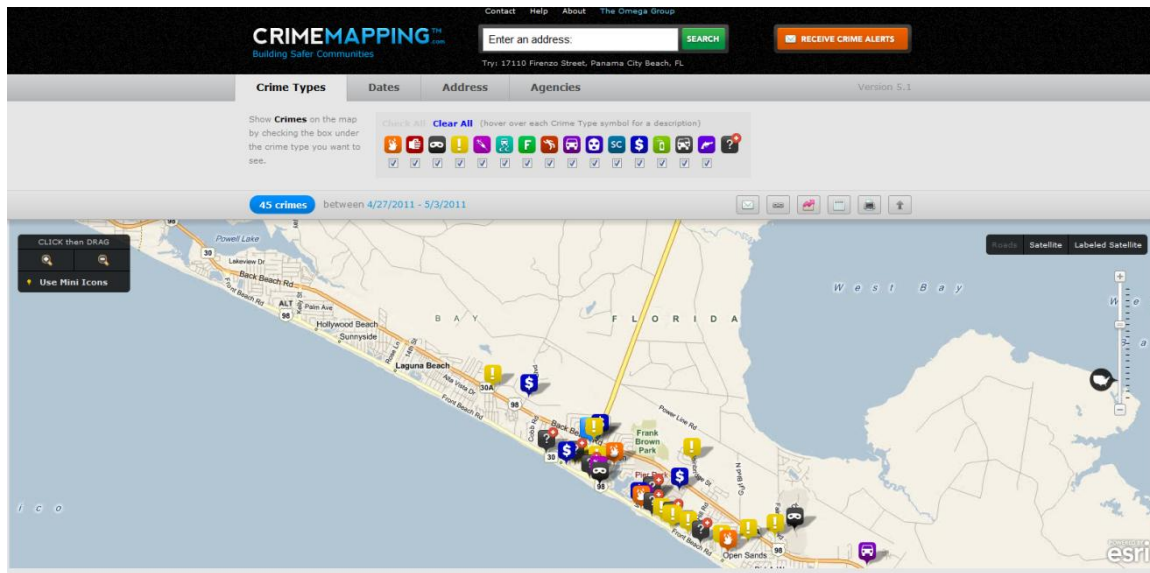


Figure 11. CrimeMapping of Panama City, Florida

Source: CrimeMapping, “CrimeMapping of Panama City, FL,” <http://www.crime-mapping.com/map.aspx?aid=1c9343b5-4e07-4086-ae91-2d36b2a9368c> (accessed 3May 2011).

The creators of CrimeMapping, The Omega Group, offer similar networks to the general public other than CrimeView. FireView provides fire and emergency response agencies with mapping tools to help review existing deployment policies and develop new strategies (CrimeMapping n.d.). It integrates fire and EMS data to allow agencies to easily map and analyze data. By identifying incident patterns and response effectiveness, resources can be more optimally redeployed.

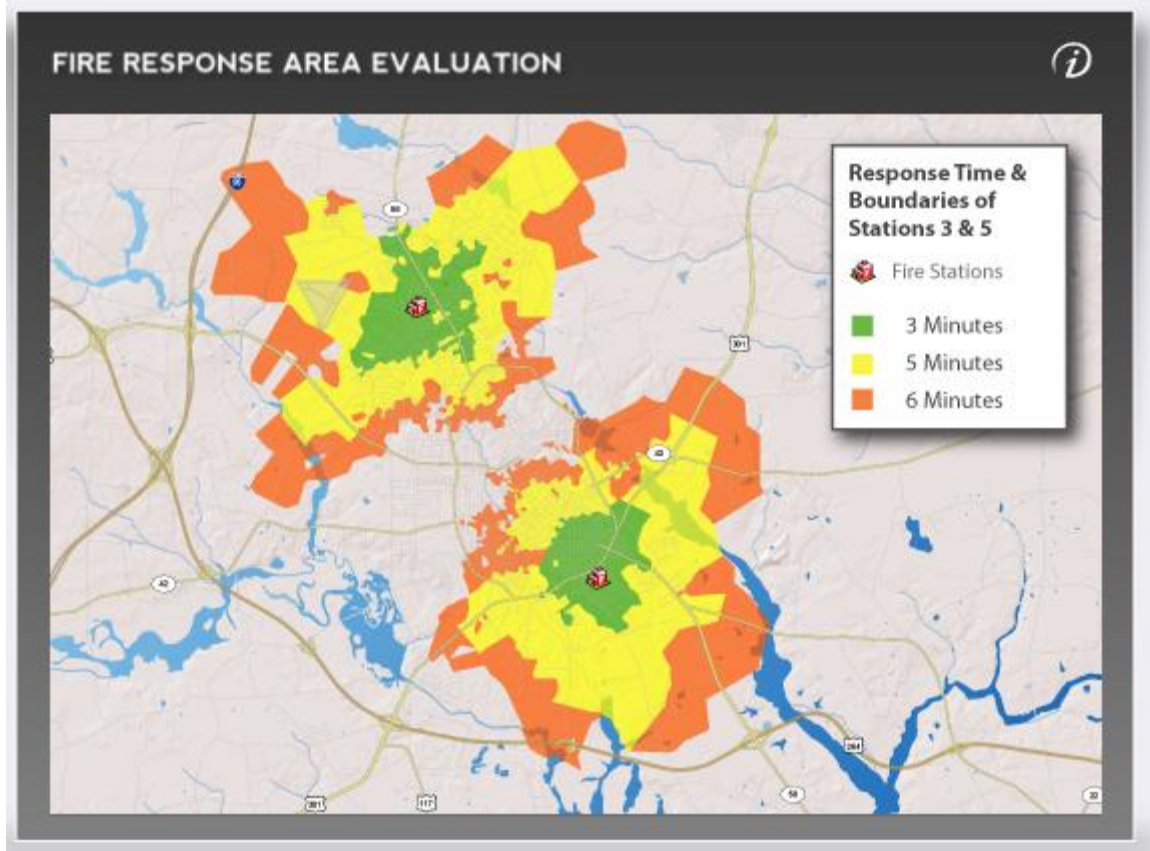


Figure 12. Fireview Screen Capture

Source: The Omega Group, "FireView Example Image," <http://www.theomegagroup.com/maps/gallery.html> (accessed 3 May 2011).

Another Omega Group product is School Planner. School Planner allows facility planners and educational administrators to allocate resources more effectively thereby improving the quality of education for all students in a given district (CrimeMapping n.d.). Student records are integrated with mapping tools that enable district staffs to locate new facilities, project future enrollments, redraw existing boundaries and distribute staff members appropriately. The School Planner network is a simple user interface that enables the end user to produce detailed analysis, maps, and reports.

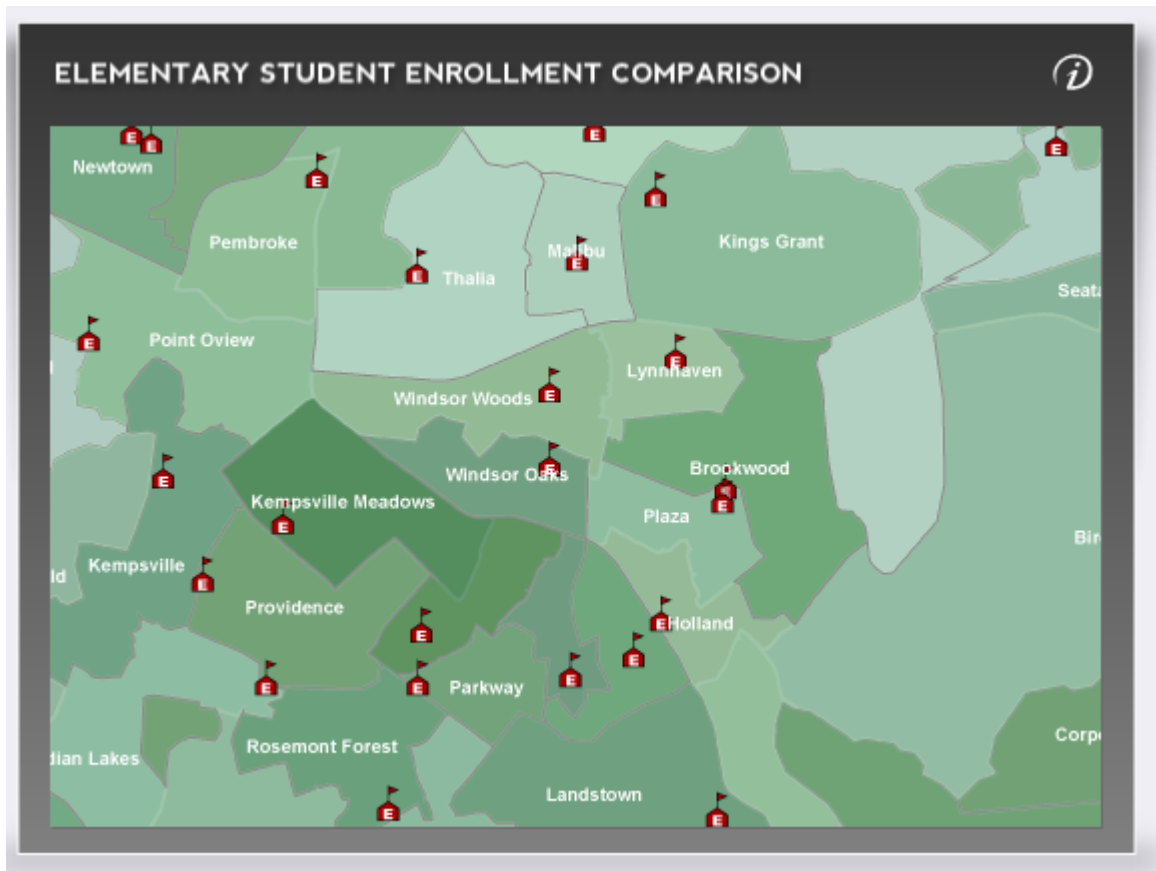


Figure 13. SchoolPlanner Screen Capture

Source: The Omega Group, “SchoolPlanner Example Image,” <http://www.theomegagroup.com/maps/gallery.html> (accessed 3 May 2011).

Crisismapping

One of the pioneers of Ushahidi, Patrick Meier, coined the term *crisismapping* to describe the technical application of crowdsourcing and co-founded the International Network of Crisis Mappers (CM*Net). CM*Net is the largest and most active international community of experts, practitioners, policymakers, technologists, researchers, journalists, scholars, hackers, and skilled volunteers engaged at the intersection between humanitarian crises, technology, and *crisismapping* (Crisis Mappers

Net n.d.). Launched in 2009, CM*Net is the world's premier crisismapping hub as it catalyzes communication and collaboration between and among crisis mappers with the purpose of advancing the study and application of crisismapping worldwide.

Virtually identical to previously mentioned crowdsourced platforms, crisismapping is the combination of information collection, visualization, and analysis (Meier 2011). The information collection, also termed sourcing, may be achieved through any number of methods ranging from paper-based surveys to the fully automated parsing of social media data on the web from mobile devices. The visualization is the categorizing of the data, usually against a map, in such a way that provides maximum insight on the data and reveals potential visual patterns. The analysis applies statistical techniques to the data for pattern detection. While these methods are not new, the crisismapping platform allows all three actions to occur in real-time, providing in-the-moment decision-support to the user (Meier 2011).

Given the increased interest in social media, the growing access to satellite imagery, and the ease of tapping into a vast pool of volunteer communities, crisismapping is an almost limitless platform for evoking change for the greater good (Meier 2011). Since most mapping platforms are based in English, language may be the only barrier to the industry's growth. However, those difficulties should be overcome within the next two years through a varying of means.



Figure 14. CrisisMap Example

Source: Oil Spill, “Oil Spill Crisis Map Image Search,” <http://oilspill.labucketbrigade.org/> (accessed 3 May 2011).

As described in the first section of Chapter 4, the most prominent social networks possess several similar and unique capabilities. Some link photos together, others share information, and some conduct multiple functions. However, all of them provide some form of collaboration. Table 3 compares and contrasts the twelve most conspicuous networks as of 2011.

Table 3. Compilation of Prominent Social Network Capabilities

	Information Sharing	Location Sharing	Business Professionals	Video Sharing	Photo Sharing	Purpose Driven
Facebook	Yes	Yes, but limited		Yes	Yes	
MySpace	Yes	Yes, but limited		Yes	Yes	
Twitter	Yes					Yes, but only when viewed from the macro level
Foursquare		Yes				
Google Maps		Yes				
LinkedIn	Yes		Yes			
YouTube				Yes		
Flickr		Yes			Yes	
Ushahidi	Yes	Yes				Yes
CrowdMap	Yes	Yes				Yes
CrimeMap	Yes	Yes				Yes
CrisisMap	Yes	Yes				Yes

Source: Social Media Defined. “Facebook.” 6 November 2008, <http://www.socialmediadefined.com/2008/11/06/facebook-defined> (accessed 19 February 2011); Social Media Defined, “Twitter,” 19 November 2008, <http://www.socialmediadefined.com/2008/11/19/twitter-defined> (accessed 19 February 2011); Social Media Defined, “Flickr,” 6 January 2009, <http://www.socialmediadefined.com/2009/01/06/flickr-defined> (accessed 20 February 2011); Social Media Defined, “LinkedIn,” 9 January 2009, <http://www.socialmediadefined.com/2009/01/30/linkedin-defined/> (accessed 21 February 2011); Jason Kincaid, “SXSW: Foursquare Scores Despite Its Flaws,” *The Washington Post*, 18 March 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/18/AR2009031802819.html> (accessed 20 February 2011); Ushahidi. n.d. <http://www.ushahidi.com/> (accessed 19 April 2011).

How have Social Networks been used to Solve Small Problems?

Some military strategists see social networks as weapons, threats, and targets.

Social networks may be used as a weapon given their critical information dissemination capability. Social networks have emerged as the preferred C4ISR, a military acronym for

Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance, all-inclusive platform for activists and protestors (Coleman 2011). Conversely, the opposition considers social networks a significant threat. It is easy to see the dangerous power of an openly available infrastructure that greatly enhances the effectiveness of a people determined to spread a message, gather forces, and launch real-time media campaigns (Coleman 2011). Lastly, the social networks themselves are targets (Coleman 2011). Attacking an enemy's communication platform is standard military practice. Interfering with a group's ability to communicate by blocking their access, effecting them with disinformation, or negating the impact of their message could be key in achieving victory. At the end of this chapter, table 4 compares and contrasts six case studies, described below, as weapons, threats, and targets.

Facebook

To those unfamiliar with the power of social networks, many see them as merely a clever way to monitor a favorite celebrity's daily activities or to obtrusively inundate one's friends with the unimportant minutia of their lives. However, to the more informed, a social network represents an immense number of abilities to harness the power of a vast number of individuals. In the past year alone, social networks have effected wholesale change into the lives of millions of people.

CNBC recently demonstrated the power of Facebook in an evening news report. An adopted young woman, Kari Lynn, used Facebook to find her biological mother. After typical adoption search efforts failed to produce answers, Kari decided to crowdsource her problem. She created a Facebook group for adopted individuals looking to connect with their biological parents (CNBC 2011). Within a month, the group

attracted over 50,000 members. Kari posted information relevant to her situation and included pictures of herself as a child and as an adult. After six months, an individual from 4000 miles away, contacted her with useful information. A waitress in Alaska noticed a resemblance between a regular customer and Kari's photo. The waitress brought the customer's attention to the Facebook group. The customer, Jen Kolb, was in fact Kari's biological mother. After some coordination, the two were able to reunite in person.

While Kari's Facebook approach used crowdsourcing to solve her problem, the Taos New Mexico's Police Department used Facebook as a giant search engine to data mine for information in order to catch a criminal (CNBC 2011). Police were unable to apprehend a parole violator because they did not know the criminal's location. Police feared the criminal had left the city, and consequently, their jurisdiction. A police officer decided to search Facebook for the criminal's known associates. In a very short amount of time, police were able to find the criminal. Even though she changed her name and left the state, officers confirmed her identity by viewing the photographs she posted under her new name. Additionally, police learned the criminal would be returning to their city when she posted her intentions to attend a high school reunion on an associate's blog. The police did not hack into any accounts, subpoena any records, or coerce Facebook into cooperating with the law. All the information they obtained was publicly available online. Subsequently, police made the apprehension and moved onto another case.

Child protection agencies have been using social networks to their benefit for a number of years. The National Center for Missing and Exploited Children claims that social networks have helped resolve and recover 98.5 percent of AMBER alerts since 2005 (O'Connor 2011). AMBER alert is the notification system for missing children. Of

1,451 AMBER notifications from 2005 to 2009, 1,430 children were found. In early 2011, Facebook set up 53 AMBER alert pages, one for each of the 50 states, along with pages for the District of Columbia, Puerto Rico, and the U.S. Virgin Islands (Marya 2011). Interested Facebook users are able to sign up for alerts for individual states, or the country as a whole. Alerts appear as news feeds and may be forwarded to friends. Users must request to receive the alerts as they are not automatically distributed to the entire Facebook network at large.

Snowmageddon

Ushahidi demonstrated its practical use in North American in 2010 in a program termed Snowmageddon. Snowmageddon was the commonplace name of massive blizzard-like storms that plagued the northeast during the 2009-2010 holidays. Ryan Ozimek and his team at PICnet and Non-Profit Soapbox built the first Snowmageddon Clean Up site in February 2010 to share information throughout Washington DC to help clean up after the year's early snow storms (Snowmageddon n.d.). The site was later replicated in New York and Boston for similar winter conditions. PICnet and Non-Profit Soapbox is a web development firm specializing in building open source software solutions for non-profits, government agencies, and NGOs (Snowmageddon n.d.).

The creators used Ushahidi as their source code for their model in order to allow for incident reporting from concerned citizens. The site was built to be a simple tool that allowed neighbors to help neighbors. The site encouraged users to offer or solicit snow shoveling needs of a non-emergency nature. The site strove to create a collaborative social network of users with similar concerns, specifically snow removal.

The Snowmageddon network was intended to be a community bulletin board for Good Samaritan assistance. The site appeared as a map of the city that corroborated four snow categories: problems, solutions, victories, and fun (Snowmageddon n.d.). The problem section cataloged users into subgroups for driveways, roads, sidewalks, cars, power, plows, elderly/disabled, potholes, and subways. The solution section cataloged users into groups offering snow blowers, plows, shovels, and cleanup assistance. The victory and fun groups allowed users to champion crowdsourced successes within their community and share useful information regarding activities such as sledding and snowball fights. The site even allowed users to post photos of their actions.

The Snowmageddon social networks demonstrated the power of like-minded communities to organize, corroborate information, and enact change, particularly with the site's capability to create a clean-up party. Users could surge snow removal efforts in their neighborhoods using their own resources without relying on government assistance. Users disseminated news about their website via Twitter and were even featured in several local and national newspaper stories (Ushahidi n.d.). Snowmageddon is the truest example of local crowdsourcing used to solve small scale problems.

toppling of two of the three of these regimes, social networks proved themselves as useful tools when focused properly.

Tunisia

A Twitter Revolution is a new term that loosely describes the effect of Twitter and other social networks upon the general public. Easily accessible by anyone with a mobile phone and not effected by internet outages, blockages, or censorship, Twitter effortlessly lends itself to spur protests and amplify outcries from large groups of peoples. Although its short ancestry could be defined from small foreign activities in 2009, many consider the January 2011 turmoil in Tunisia to be the first true Twitter Revolution (Zuckerman 2011). Beginning in the month prior, December 2010, social media likely played a very significant role in the revolution that led to the resignation of Tunisian President Zine el Abidine ben Ali after 23 years of harsh rule. The revolution began when local bloggers began to share information after a young unemployed man poured gasoline over himself and lit himself on fire in protest of the government's corruption 17 December 2010 (Nguyen 2011). The man later died of his injuries.

The Tunisian government banned all foreign news outlets from entering their country. Undeterred by the regime's actions to thwart their efforts to tell the world their stories, Tunisians turned to the virtual world to send their messages. When the government shut down the country's Internet to stop the spread of information, the local people turned to Twitter, Facebook, and YouTube to continue their spread of ideas, coordinate protests, and alert each other where to avoid the military (Nguyen 2011). Citizens used their mobile devices to document incidents of corruption wherever

witnessed via tweets, posts, and video. Oppressors were powerless to stop 100,000-person protests as they did not occur in physical locations.

As the protests intensified, Ben Ali offered concessions such as a projected end-date to his presidency, a more-lenient security force, lower food prices, freer media, and an end to internet censorship (Zuckerman 2011). Unswayed by his promises, Tunisia demanded Ben Ali's immediate resignation. The Tunisia President was not able to quell his nation's unrest as neither the police nor military could halt the digital movement occurring on Twitter. On 14 January 2011, the Tunisian people got their wish as Ben Ali stepped down from office and fled the country.

Egypt

In February 2011, Google marketing executive Wael Ghonim stated, "If you want to liberate a society, just give them the internet" (Sifry 2011). Ghonim was referring to the recent events in Egypt that brought an end to an almost 30-year rule by Hosni Mubarak. The Internet made a significant impact in Egypt. For years, the country's secret police and state-controlled media very effectively suppressed most dissident activities. However, their communication stranglehold on their populace changed with the advent of Facebook, Twitter, and YouTube. Citizens were now able to express their opinions, share ideas, debate issues, and rally supporters with relative ease.

Ghonim inadvertently became the symbol of Egypt's pro-democracy uprising after he launched a Facebook page that he called Revolution 2.0, the initial Egyptian upheaval protest (Gustin 2011). Ghonim's message quickly spread through the country like wildfire in blogs, YouTube, and Twitter. Facebook helped organize the activists inside the country and Twitter functioned to help get the message out to the broader

world (Gustin 2011). In just over 18 days, the 30-year regime of Mubarak fell. While the cries of the protestors were not new, the Egyptian regime underestimated the power of technology to organize activists and drive their movement.

However, it would be unjust to say Mubarak was ousted solely based in the efforts of Egypt's digital warriors. A nucleus of human rights activists, lawyers, bloggers, and labor organizers had been hard at work for several years in Egypt, risking prison, holding small rallies and vigils, raising consciousness by distributing pictures and videos of torture victims, writing protest manuals, mobilizing legal action to petition arrested comrades out of prison, and studying the lessons of other failed uprisings in order to develop strategies to build their movement (Sifry 2011). The insertion of their efforts into social network platforms only served to amplify their efforts. Similar to the power of crowdsourcing residing in a massive volunteer work force to solve problems, social networks must be fuelled by the motivations of its users to enact change. Facebook and Twitter did not overthrow Egypt's ruling party on its own, but instead, proved another medium for revolutionaries to launch their attacks. Social networks served as the magnifying glass for the protests already there. Facebook was the accelerant to conditions already in Egypt while Twitter and YouTube amplified what was happening on the ground, all of which directly affected Western media coverage (Gustin 2011).

Libya

Some third-world nations have not embraced the internet as freely as the United States. For instance, Facebook is often blocked in Libya. However, denied access to a grand-scale social platform such as Facebook has not stopped Libyans from connecting through other digital forums. One virtual freedom fighter used another platform to meet

his needs. To avoid detection by Libyan secret police who monitor Facebook and Twitter, Omar Shibliyi Mahmoudi, the leader of the Ekhtalef Difference Movement used a Middle Eastern dating website to send coded love letters to rally his revolution (Kofman and Heussner 2011). The Libyan businessman-turned-opposition-leader saw the power of digital action as he watched neighboring revolutions topple their tyrannical governments (Kofman and Heussner 2011).

Since the Libyan internet is so restrictive, exiled Libyans have fueled the revolution on social networks from outside their home country. According to Nasser Wedaddy, a civil rights outreach director for the American Islamic Congress and longtime cyber activist who has worked on cyber outreach efforts in the Middle East for years, many consider Libya to be a digital black hole (Kofman and Heussner 2011). Even though the current regime suppressed efforts within Libya, the power of social media continues to exert pressure from outside the borders as former Libyan residents share stories and information about their experiences when they resided there.

Inspired by the uprisings in Tunisia and Egypt, Libyans took to the streets 17 February 2011, in order to defy the nation's security crackdown. Named the Day of Rage, protestors gathered in four cities to express their desires to see Muammar Gaddafi, the country's longtime leader, resign his position (Al Jazeera 2011). Revolutionaries used social networks to coordinate their messages, gatherings, and communications. Similar to other governments dealing with rebellion, Libyan officials were unable to stop Twitter activities geared against them. In an interesting turn, the Libyan regime began using social media to communicate their own messages as well. Officials sent text messages and tweets to the general public, warning them that live bullets would be used to disperse

protesting crowds (Al Jazeera 2011). True to their word, Libyan riot forces killed several protesting individuals over the next few days.

Obama Presidential Campaign

During his presidential campaign, Barack Obama turned to social networks to further his agenda. On 5 February 2007, 20-year old Meredith Segal created the Barack Obama for President in 2008 Facebook page (Seipel 2007). The site gained over 200,000 fans in its first three weeks and quickly became one of Facebook's most often visited forums. Facebook is commonly used by college-aged individuals, a demographic not known for their voting participation. Some political analysts feel Obama's targeting of young voting via social networks was vital to his win for the presidency (CNBC 2011). Considered a once-in-a-lifetime movement to get elected in 2008, Obama captured young people like few other recent candidates and was the first to really organize a campaign on the Internet. In 2008, he had nearly four times as many Facebook and MySpace supporters and 240 times more Twitter followers as his rival, Senator John McCain (Dougherty 2011).

Hoping to repeat his early election success, President Obama continues to use social media as a frequent outlet for his party's upcoming election. The President recently conducted an online town hall meeting with the founder of Facebook, Mark Zuckerberg, on 20 April 2011 (Dougherty 2011). Supporters and on-lookers were able to watch the event live through the President's Facebook page. His page has well over 19 million fans.



Figure 16. President Obama's Facebook Page

Source: Facebook, "President Obama's Facebook Page," <https://www.Facebook.com/barackobama> (accessed 3 May 2011).

Summary and Conclusion

Chapter 4 was organized by three research questions. The first research question, how do social networks create linkages, described the several subcategories of social networks and their capabilities. The second research question, how have social networks been used to solve small problems, discussed the application of social networks to solve real problems at an individual and small organization level. The third and final research question, how have social networks been used to enact large-scale changes, discussed world-changing events from the past three years powered by social networks.

Social networks demonstrated their usefulness to a myriad of individuals, organizations, and countries looking to solve various problems Whether searching for answers or provoking change, social networks have been at the heart of new social directions for the past several years.

Table 4. Comparison of Case Studies

	Weapon	Threat	Target
Facebook	Yes, both the adoption and criminal manhunt demonstrated C4ISR capability	No, neither the birth mother nor the wanted felon deemed social networks to be a threat	No, the social networks themselves were never targeted, but they were used in the targeting process to find human targets
Snowmageddon	Yes, this platform excelled at C4ISR	No, citizens did not view this network as a threat, instead they greatly embraced it	No, the network was never targeted, but it enhanced the targeting process when applying limited resources
Tunisia	Yes, insurgents used social networks to organize actions	No, Tunisian officials blocked traditional news outlets, but failed to see the potential threat from social networks	No, Tunisian officials never targeted social networks
Egypt	Yes, insurgents used social networks to organize actions	No, Egyptian officials failed to block the digital revolution occurring on social networks	No, Egyptian officials never targeted social networks
Libya	Yes, insurgents used social networks to organize actions	Yes, Libyan officials often block access to social media sites deemed a threat by severing internet connections	Yes, Libyan regime used social networks to warn, target, and kill protesting crowds before denying access to their citizens
Obama Campaign	Yes, social networks greatly influenced and organized prospective voters	No, Sen McCain never deemed social networks a threat to his campaign, failed to embrace them	No, the Obama campaign only used social networks as a means to engage young voters

Source: “The Facebook Obsession,” *CNBC*, 6 January 2011; Snowmageddon. n.d., <http://nyc.snowmageddoncleanup.com/page/index/2> (accessed 23 April 2011); Ethan Zuckerman, “The First Twitter Revolution?” *Foreign Policy*, 14 January 2011, http://www.foreignpolicy.com/articles/2011/01/14/the_first_twitter_revolution (accessed 14 January, 2011); Sam Gustin, “Social Media Sparked, Accelerated Egypt’s Revolutionary Fire,” *Wired*, 11 February 2011, <http://www.wired.com/epicenter/2011/02/egypts-revolutionary-fire/> (accessed 27 February 2011); Al Jazeera.net, “Day of Rage Kicks Off in Libya,” 24 February 2011, <http://english.aljazeera.net/news/africa/2011/02/201121755057219793.html> (accessed 25 February 2011); Arnie G. Seipel, “Obama’s Facebook campaign,” *CBS News*, 5 February 2007, <http://www.cbsnews.com/stories/2007/02/05/politics/main2434323.shtml> (accessed 23 April 2011).

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this thesis was to prove the utility of using social networks to assist analysts fight terrorism. By detailing the capabilities of social networks and demonstrating their applications, the research illuminates a supportive argument for the thesis. Social networks can be used to assist analysts fight terrorism.

Chapter 5 is organized into four primary follow-up questions: what do the results mean, what direction will the United States choose, what are the implications for the Department of Defense, and were there any unexpected findings. Additionally, chapter 5 offers further topics for study and a final conclusion. The previous chapter illustrated the most prominent social networks and their successful applications to affect individual and global problem sets. The discussion clearly demonstrates the potential for useful application of social networks to solve problems.

What do the Results Mean?

Table 4 clearly shows an evolution of the applicability of social networks to solve problems. All six case studies demonstrate how each user, whether revolutionary or concerned citizen, used social networks as a weapon. Users communicated with each other, controlled limited resources, commanded large organizations, and organized events. Social networks proved to be effective coordination tools for collaborators.

As far as seeing social networks as a potential threat, only Libya came to this conclusion. The opposing force failed to see their own vulnerability in all cases except Libya. The birth-mother and wanted felony saw no danger of exposure when they willingly placed their personal information into Facebook. Senator McCain dismissed the

power of social networks to bridge the gap between his campaign and younger voters (Dougherty 2011). The governments of Tunisia and Egypt thwarted most actual protests, but never noticed digital uprisings until it was too late. Only Gaddafi's regime in Libya recognized social networks as a dangerous threat, perhaps after witnessing regime changes in Tunisia and Egypt through similar means.

Consequently, of all the case studies, the Libya case was also the only instance to demonstrate an actual targeting of the social networks themselves. Before discontinuing internet access and social network connections, Libyan officials used social networks as a means to their ends, resulting in several dead protestors (Al Jazeera 2011). While the end of the Libyan story has yet to be written, Gaddafi's reign has learned the lesson of other nations' failures in ignoring the power of social networks.

What direction will the United States choose?

Throughout the course of the research for this thesis over the past year, there has been a positive global shift in support of social networks. While personal use continues to expand, professional use, especially governmental, has increased profoundly. The positive demand for the application of social networks is a clear call-to-arms.

In January 2010, Secretary of State Hillary Clinton delivered a thought-provoking speech regarding internet freedom that drew international attention (Lakshmanan 2011). She praised Google Inc. for resisting Chinese censorship. In her speech, she stated three goals: to promote Internet freedom and push back against governments that restricted it, to press U.S. corporations to resist censorship and defend privacy, and to fund new online and mobile technologies that evade censorship and repression (Clinton 2011).

In a gathering of over 250 U.S. Ambassadors in January 2011, Clinton stressed the importance of social media. Given the recent events in Egypt and Tunisia, Clinton sought to emphasize the importance of civilian power. She called on all diplomats to adapt to a fast-changing world and asked them to begin using social media to communicate with people on the ground. She said, “Social media is going to change things, and if we are not on top of it and driving the message and responding to it as effectively as we can, we are going to be left behind” (Epstein 2011).

Shortly after Clinton’s remarks, the U.S. State Department launched an official Farsi version of the Twitter social network, in hopes of connecting individuals and encouraging discussion amongst Iranians all over the world (Castillo 2011). In its first tweet, the department said, “US State Dept recognizes historical role of social media among Iranians. We want to join in your conversation” (Department n.d.). Soon thereafter, the State Department launched an Arabic Twitter platform as well.

Increasing amounts of government and law enforcement agencies use social networks to alert people of events as they happen. More and more local police, county sheriffs, and federal agencies have Facebook and Twitter accounts (Fox 59 News 2011). From Amber Alerts to weather emergencies, information conveyed via social networks has reached levels of influence on par with television, radio, and newspapers. Now the U.S. Government is looking at using Facebook and Twitter to announce changes in its terror alerts (Hodson 2011). This is part of a larger restructuring of the current way terror alerts are classified and then sent out as notification to the public. This application of social networks directly supports the initial conclusion of this thesis. Social networks can be used to assist analysts fight terrorism.

What are the Implications for the Department of Defense?

Similar to the State Department, DoD also adapted social networks into its practice. At first very prohibitive, the U.S. Marine Corp and the U.S. Strategic Command (STRATCOM) almost completely banned all social network access on official computers (Wellman 2011). However, after much public debate, DoD quickly loosened the restrictions imposed upon its personnel. DoD officially acknowledged social networks in a February 2010 Memorandum titled: Directive-Type Memorandum (DTM) 09-026 - Responsible and Effective Use of Internet-based Capabilities (Defense 2010). Originally set to expire in March 2011, the policy expanded permission for DoD professionals to access social networks on government computers. DoD later updated the policy in February 2011, now set to expire in March 2012, to allow even greater social network access so long as it was not for unethical purposes (Defense 2010). As described under the Joint Ethics Regulation, the new policy aims to only restrict social network access to thwart activities such as pornography, gambling, or hate-crime related actions.

Since DoD lifted its ban on social networks, several U.S. Government leaders have embraced it. Senior military leaders use Twitter to gain access to lower ranks and subordinates. Admiral Mike Mullen, the highest ranking member of the U.S. military and the current Chairman of the Joint Chiefs of Staff, joined Twitter in April 2009 (Weiner 2009). He currently has over 44,000 followers. Additionally, Secretary of Defense Robert Gates championed Twitter as a huge strategic asset in 2009 (Levi 2009).

In an effort to create a long-standing usage policy, DoD released several guides addressing policy, dissemination, education and training, compliance monitoring, and compliance enforcement (Brown 2011). The DoD social media website invites users to

interact with them via Facebook, Twitter, Flickr, and YouTube (U. D. Defense n.d.). DoD departments use various social network platforms to publish digital products, handbooks, conduct surveys, and host blogs.

The U.S. Army has endeavored to empower all soldiers with smartphones in order to access social network tools and information from the battlefield. For the past year, Vice Chief of Staff of the Army, General Peter Chiarelli has championed the Common Operating Environment. It is a series of standards by which software developers can design applications that tap directly into the Army's data systems, known collectively as its Enterprise Network (Ackerman 2011). The Common Operating Environment aims to enhance communication between soldiers and desired information. The program has fostered support by conducting contests to develop new applications, or Apps, from within the Army community, such as one that digitizes the Army's physical-training standards (Ackerman 2011).

General Chiarelli supports digitization for soldiers at the lowest levels. The Army is currently developing smartphones, similar to the Apple iPhone, that are pre-programmed with combat relevant Apps such as first aid, call-for-fire, and communication aids. While future technology testing is not new to Army research and development, the smartphone program is part of a larger project called Connecting Soldiers to Digital Applications (Hodge 2010). Testing continues as exact fielding dates are unknown. Meanwhile, inventive soldiers use existing technology to add to their survivability. Since 2009, soldiers and marines have used commercial GPS handheld devices to create safe passage lanes through dangerous areas. Called Honesty Traces, soldiers plot, then later share, cleared waypoints through suspected IED fields and

ambush positions (Hodge 2009). The Army hopes to incorporate similar features into its smartphones issued to soldiers.

Some U.S. Government agencies have turned to social networks to assist collaboration amongst their subject matter experts. DISA, the Defense Information System Agency, developed its own social network called Forge. The Forge community is designed to help users better coordinate, share information, and manage content, while providing a more holistic view of its agency's hundreds of projects (Corrin 2011). The network design allows shared development and uses open source software in order to support a web-based collaborative development environment.

U.S. Central Command (CENTCOM) increased its psychological warfare operations using software that allows it to target social media websites used by terrorists (Waterman 2011). The special computer program allows soldiers to create multiple fake identities on the Internet. The military uses the fictitious identities to infiltrate groups, spread disinformation, and disrupt operations. The program is aimed at persuading extremists to allow soldiers into their bulletin boards. Technically not analysis, this is an active attempt to draw out suspected terrorists. These activities would be better categorized as an operation that uses social networks as a targeting tool, refining the intended recipient of the U.S. action.

The most promising DoD social network endeavor could be the SKOPE Intelligence Cell. SKOPE is a joint intelligence analytic cell with the National Geospatial-Intelligence Agency, SOCOM, and STRATCOM. It began with a specific request from military commanders for sensors to help narrow the search space for terrorists and terror groups. The SKOPE cell applies all source, multi-purpose

intelligence analysis linked to a spot on Earth. Through its application of human terrain analysis, SKOPE incorporates aspects of the U.S. Army's Human Terrain System, a proof-of-concept program to improve the military's ability to understand the highly complex local sociocultural environment in areas of deployment (Council 2009). The National Geospatial Intelligence Agency defines human terrain analysis as the multi-intelligence, multidisciplinary scientific approach to describing and predicting spatial and temporal patterns of human behavior by analyzing the attributes, action, reactions, and interaction of groups or individuals in the context of their environment (Council 2009).

Led by Lieutenant Colonel Al Di Leonardo, the SKOPE program was not originally embraced by DoD. However, now fully supported by the SOCOM and Intelligence Communities, SKOPE has a promising future ahead. Using collaboration to become a productive analytical innovation cell for the U.S. Government, SKOPE has become a pioneer in creating geospatial hot-spotting techniques (Kenyon 2011). SKOPE continues to develop various innovative tools and techniques in social networking and geospatial and data technologies. SKOPE truly represents the way ahead for DoD social network analysis.

Were there any Unexpected Findings?

Dissenting Opinion Regarding Crowdsourcing

Not everyone is convinced of the power of crowdsourcing. In fact, several analysts strongly claim the idea of crowdsourcing is more powerful than crowdsourcing itself. The skeptics believe the word crowdsourcing has created an illusion that there is a crowd that solves problems better than individuals (Woods 2009). While a problem could be disseminated to millions of individuals, select individuals usually present the solution

rather than relying on the strength of the masses. Dissenters of the crowdsourcing theory feel problems may only be solved by uniquely talented and highly trained people (Woods 2009). Their inclusion in a large crowd is immaterial as the crowd is not producing the solution. Skeptics feel crowdsourcing devalues the role of the highly specialized individual when solving complex problems. These individuals need funding, grants, and attention. The concept of a no-cost work force in crowdsourcing jeopardizes the support of the elite problem solver. Skeptics would rather rename crowdsourcing as broadcast searching (Woods 2009). If large groups receive notice of a complex problem through open announcement, the appropriately trained individual will surface to present a solution.

Social Networks may not be Predictive of Future Events

While some analyst feel social networks are a very useful tool, they will not revolutionize the analytical landscape. The two largest flaws of social networks most often cited are that social networks contain too much information to be consumed by DoD analysts in a relevant amount of time and social network have not, as of yet, been an accurate predictor of future events (Benson 2011). Director of National Intelligence, James Clapper, supports OSINT, but acknowledges more needs to be done. Director of the Central Intelligence Agency, Leon Panetta told lawmakers in a statement about social media, “Searching through 600 million Facebook accounts, 190 million Twitter accounts, and 35,000 hours of YouTube videos for actionable intelligence poses a daunting task” (Benson 2011). Both Clapper and Panetta agree social media sites are not necessarily predictive of what might happen. While Twitter and Facebook were very useful for intelligence officials to monitor real-time events in the Egypt revolution during its

occurrence, neither social network gave any indication it would happen prior to its beginning.

Privacy Violations

Another counterargument to the usefulness of social networks stems from a small sense of generalized paranoia. Apple recently admitted its iPhone smartphones were inadvertently tracking the movements of its users when the phone's GPS randomly sent location information to a large server database (Sutter 2011). While Apple claims the information was never utilized or shared with third-party members, novice hackers were able to access the data easily. The idea of the Big Brother government trampling individual privacy scares many individuals. Bloggers and op-ed pieces throughout America voice their concerns about individualized location tracking. Could marketers access the information to better target prospective sales targets? Could a stolen phone aid a stalker track a potential victim? Could law enforcement officials issue a warrant to seize smartphone data to confirm or deny suspected whereabouts in relations to crimes (Chen and Isaac 2011)? The heart of the issue resides with individual rights and their protections. Support for the analysis of social networks will never succeed if the general public believes their right to privacy has been invaded by the U.S. Government.

Lack of Responsibility and Accountability

The last argument about using social networks to assist analysts is the prevailing lack of responsibility from private sector corporations. As with any off-the-shelf product used by the U.S. Government, what you see is what you get. The U.S. Government has no control over the application of publicly available services, assuming the companies

that provide them are not in violation of any laws. The loudest recent argument against Facebook and Twitter concerns the potential for violence offered by their platforms. While the digital revolutions of Egypt and Tunisia seemed to have produced results leading to the betterment of mankind, the opposition possesses the same capabilities for their own perverted means, as Libya effectively demonstrated. Social networks are subject to routine scrutiny regarding privacy and free speech, but they tend to shy away from recognition as a political tool. Some leaders have chided social networks for their lack of accountability. Recently, after pressure from an Israeli minister, Facebook staff began monitoring a page calling for a third intifada in Palestine, eventually taking the page down, claiming that it contained incitement to violence (York 2011). Unless other members of government take action, social network could continue to serve as platforms for unabated future violence.

Further Research Topics

As demonstrated in this thesis, the collaborative power of social networks remains unlimited. While social networks tracked, monitored, and assisted revolutions in Tunisia and Egypt, perhaps the next stage transfers from a passive capacity to a more active role. Could social networks become the next battlefield weapon of choice to thwart revolts as well? Unscrupulous regimes could announce false protests to uncover and target potential insurgents. The openness of most social networks lends themselves to deception operations since both sides of opposing forces possess equal access.

Another potential research topic could include social network activity between nations. Could social networks be used to export war as well? It would be an interesting experiment to see if one nation could invoke a response from another nation, using only

social networks. Users from another country could use social networks to seed plans of insurrection, foment thoughts about the incompetence of national leaders, or urge citizens to take-up arms against their oppressors. Would such actions be deemed acts of war?

Lastly, it would be prudent to research the impact social networks have had on individual privacy. While briefly mentioned earlier in this Chapter, privacy issues continue to remain relevant in the United States. What laws need revision to protect an individual's right to privacy in public social networks? Social networks could change a great deal of the legal landscape in America.

Conclusion: Social Networks Can Assist Analysts Fight Terrorism

Whether solving small problems or creating global change, social networks provide the collaborative platform for action. The networks themselves are not as important as the people they represent, and the sum of their abilities. Never before have people been so easily united by common threads for a collective purpose. Whether winning a presidential election or overthrowing a cruel dictator, social networks achieve results when properly implemented. Social networks are useful tools to solve problems and enact change. Therefore, social networks can assist analysts fight terrorism.

GLOSSARY

AMBER. A national alert system to announce and coordinate efforts to recover missing children.

Blog. A digital journal for amateur reporting and commenting.

Check In. The term for linking a user to a geographic reference point using a social network.

CrowdMap. A sub-set of Ushahidi, used for generic neogeography.

CrimeMap. A sub-set of Ushahidi, used for crime-based neogeography.

CrisisMap. A sub-set of Ushahidi, used for crisis-based neogeography.

Facebook. A public, online social network that allows users to interact with other users through a digital portal called a profile. Shared data includes texts, photos, videos, and other internet links.

Flickr. A public, photo-sharing social network.

Following. The generic term for associating one digital profile to another digital profile on Twitter.

Friend. A known associate linked to a user through a social network.

Foursquare. A public, location-based social network that allows users to share information regarding specific locations via neogeography.

Google Maps. A public, digital service that grants users access to basic mapping tools, photos, and satellite images.

LinkedIn. A public, business professional-based social network that allows users to connect ideas for business related purposes such as job searches and project collaboration.

MySpace. A public, online social network that allows users to interact with other users through a digital portal called a profile. Shared data includes texts, photos, videos, and other internet links.

Neogeography. A science that combines cartography and geographic information systems into a user-friendly collaborate tool.

Post. The act of sharing information on another user's digital profile within a social network.

Profile. A digital portal that defines a user to an online community.

Second Screen. A Twitter phenomenon when real-time chatter between millions of users creates a spike in the use of the social network, usually as a result of increased interest in an event occurring on television, the first screen.

Snowmageddon. A product of Ushahidi used to collaborate snow removal efforts.

Social Media. An interchangeable term for a Social Network, commonly applied when used by a prominent public figure.

Social Network. A digital community for online collaboration. Prime examples of social networks are Facebook, Twitter, and YouTube.

Tags. A link associating a digital profile to a digital photograph through a social network.

Tips. A collection of information associated with a geographic location through a social network.

Tweet. The term for a text message sent via Twitter, limited to a maximum of 140 characters.

Twitter. A public, online social network that allows users to communicate via text messages capped at 140 characters.

Ushahidi. A free-service, neogeographic social network that is tailorable to meet the needs of the user.

Viral. A massively shared piece of media on the internet.

Wall. The generic term for the mark-able space on a user's digital profile within a social network where other users can leave messages and share information.

YouTube. A public, video-sharing social network.

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